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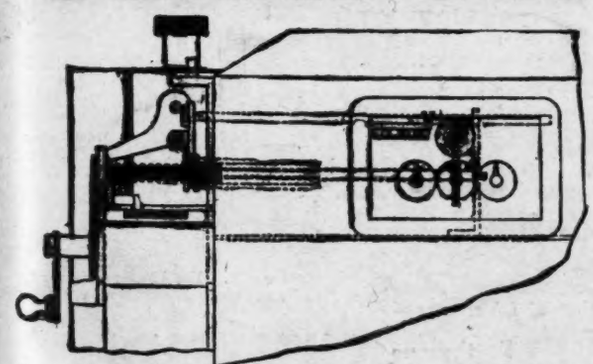
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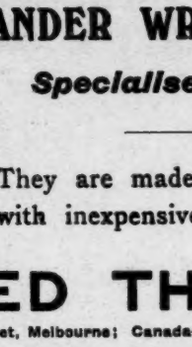

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EDITORIAL NOTES.

Working Statistics Analyzed.

THANKS are due to Mr. F. J. Bradfield, the Secretary of the Commercial Gas Company, for his promptitude in preparing for publication the analysis of the accounts for the past half year of the three London Companies, and of their neighbours the Wandsworth, South Suburban, and Tottenham Companies. The Brentford Company are only meeting annually now, so that their accounts are not available for treatment as hitherto. Mr. Bradfield carries his analysis over an area of information that offers a large amount of interest to those who like to revel in statistical data of the kind. Every line invites investigation; but here we must be satisfied with drawing attention to one or two only of the groups of figures.

Despite the impediments to the sales of gas—decreased street and shop lighting, reduced hours of licensed premises, and the Summer Time Act—it is seen that the half-a-dozen Companies whose accounts are analyzed all made a gain upon the gas business of the corresponding half of 1915. The Suburban Companies, however, did better than the London ones in the matter of increase—the Tottenham Company netting 11·34 per cent., the South Suburban Company 4·39 per cent., and the Wandsworth Company 1·97 per cent. The London Companies did not do so well reckoning their increases as percentages, though the Gas Light figure approaches the Wandsworth—being 1·94 per cent. But the 1·94 per cent. increase of the Gas Light Company is 260,491,000 cubic feet, while the Wandsworth 1·97 per cent. represents only 24,995,000 cubic feet. In volume, too, the 1·94 per cent. of the Gas Light Company is nearly twice as much as the increase of 11·34 per cent. of the Tottenham Company—the respective figures being the before-mentioned 260,491,000 cubic feet and 133,829,000 cubic feet. Or take the 0·72 per cent. increase of the South Metropolitan Company, this is nearly equal in volume to the 4·39 per cent. of the South Suburban Company—viz., 47,566,000 cubic feet, compared with 48,791,000 cubic feet. These figures illustrate one of the misrepresentations of percentages.

All through the Companies, excepting in the case of the South Metropolitan Company, there has been a reduction of the make of gas per ton of coal carbonized. The comparison that was made in this respect, in dealing with the Gas Light accounts in the "JOURNAL" for Aug. 1, should have referred to the first half of 1914, and not to that of 1915. Compared with the June half of 1915, the Gas Light production per ton last half year of 12,733 cubic feet was *minus* 311 cubic feet; the South Metropolitan Company, with a make of 12,249 cubic feet, put on an additional 69 cubic feet per ton; the Commercial Gas Company, with a yield of 13,933 cubic feet was short by 86 cubic feet of the corresponding production; the Wandsworth Company, with a make of 13,124 cubic feet, showed a setback of 302 cubic feet; the South Suburban Company, with a production of 12,968 cubic feet, a falling-off of 42 cubic feet; and the Tottenham Company, with a yield of 12,201 cubic feet, a falling-off of 610 cubic feet—this large difference for Tottenham being no doubt due in part to the inferior quality of the coal delivered, and to the compulsory use of the inefficient works at Ponder's End, owing to the unavoidable delay in the construction of the new carbonizing plant at Tottenham. Another particularly interesting item is the variation that the half year saw in the make of carburetted water gas. There was a decrease all along the line; and this tells a tale as to the "pinch" that is being felt in respect of oil supplies and prices. Of the total make of the Gas Light Company, 23·21 per cent. was carburetted water gas, or a reduction of 10·11 per cent.; of that of the Commercial Company, 32·57 per cent., or a diminution of 4·15 per cent.; of that of the Wandsworth Company, 20·44 per cent., or a decrease of 8·66 per cent.; of that of the South Suburban Company, 12·83 per cent., or a decline of 6·79 per cent.; and of that of the Tottenham Company, 30·98 per cent., or a reduction of 1·68 per cent.

One other particularly interesting group of figures relates to the gross and net costs of raw material per 1000 cubic feet of gas sold. The South Metropolitan and the South Suburban Companies showed the heaviest gross costs last half year—the South Metropolitan being 24·95d., and the South Suburban 24·85d. But the former Company did better than any of the others with residuals, obtaining for them 16·38d. per 1000 cubic feet of gas sold, which brought their net cost of coal down to the second best place—8·57d.; the first place being occupied by the Wandsworth Company, with a net cost of 7·19d., due to the gross cost of their coal being down to 19·97d., and the residuals realizing 12·78d. The Gas Light and Coke Company in their residuals results were about 3d. per 1000 cubic feet of gas sold behind the South Metropolitan Company; but with 13·27d. they stood second best in the residuals receipts per 1000 cubic feet of gas sold. The gross cost of raw material was 22·48d., and the net cost 9·21d. The Commercial Company came hard upon this with 9·26d.; the gross cost of their raw material having been 21·01d., with 11·75d. as the sum received for residuals. But, comparatively, the South Suburban and Tottenham Companies come out badly in their net costs of raw materials—respectively 12·76d. and 12·14d. But the figures are due to the high gross cost of raw materials in the case of the South Suburban Company (24·85d.), and to the low receipts for residuals in the case of the Tottenham Company (8·48d.)—this 8·48d. being only about half as much as was received by the South Metropolitan Company per 1000 cubic feet of gas sold. The receipts for residuals were 12·09d. in the case of the South Suburban Company; and the gross cost of materials in the case of the Tottenham Company was 20·62d. It should be pointed out that Tottenham was selling the main part of its gas output at 2s. 3d. per 1000 cubic feet, which, save Wandsworth, was the lowest charge in the London area. However, the figures show that the net cost of raw materials per 1000 cubic feet of gas sold was, compared with the corresponding period of last year, 1·17d. less in the case of the South Metropolitan Company, and 0·96d. less in that of the Wandsworth Company; but the South Suburban Company showed an increase of 3·77d., Tottenham of 2·25d., the Gas Light Company of 1·32d., and the Commercial Company of 0·84d. The second table shows that all the Companies increased their receipts for residuals in every respect, except the South Suburban and Tottenham Companies, who, in the matter of tar, were respectively down 0·11d. and 0·16d. per 1000 cubic feet of gas sold. The actual increases over the whole of the residuals, compared with the corresponding half of 1915, were: Gas Light Company, 5·43d. per 1000 cubic feet of gas sold; South Metropolitan, 4·67d.; Commercial, 4·63d.; Wandsworth, 4·73d.; South Suburban, 1·24d.; Tottenham, 1·75d.

The way the costs per ton of coal delivered have gone up is seen in the "Sundries" section of the tables. The Gas Light Company paid 24s. 7·66d. per ton, which is 5s. 3·31d. more than in the corresponding period of 1915; the South Metropolitan Company paid 24s. 4·64d., which is an increase of 3s. 7·07d.; the Commercial Company paid 25s. 6·38d., which is an advance of 6s. 1·47d.; the Wandsworth Company paid 22s. 0·15d., which is an augmentation of 3s. 0·46d.; and the Tottenham Company paid 23s. 4·43d., which is a rise of 4s. 4·05d. The South Suburban figures for coal are not included. Coke receipts per ton of coal did not advance with equal steps; but the extra realizations helped substantially to diminish the weight of the additional burden for coal.

A Peep Behind the Scenes.

Some chairmen of gas companies think it their duty, when addressing share or stock holders, to go, with religious devotion, through the items of the accounts from their *alpha* to their *omega*. This is a tiresome ordeal for most of the hearers, as, if they have a liking for statistical comparisons, they can well, from the printed statements, make them on their own account. Share or stock holders do not, as a rule, go to meetings for information already in their possession, through the report and accounts. They hope for something more. They hope for explanations (if there are any of value to give); they hope to be taken into confidence; they hope to have, so far as is advisable in the interests of the Company, "a peep behind the scenes." What they do not hope for is to be sent into a somnolent state by the aid of statistical narcotics. In his address to the proprietors of the South Metropolitan Company last Wednesday, the Chairman (Mr. Charles Carpenter, D.Sc.) indulged in few figures, and practically no comparisons; but he gave the proprietors a considerable amount of information which was not to be found in the report and accounts, but which assisted them to appreciate more than they could otherwise have done present important conditions and future prospects.

As already announced, the Directors of the Company have taken the lead in giving the consumers the benefit of the first relaxation of war conditions which necessitated the rise, from 2s. 2d. to 2s. 10d., in the price charged for gas. The benefit is represented by 2d. per 1000 cubic feet; and, while the Directors have as great satisfaction in announcing the reduction as the consumers have in receiving it, and the proprietors and co-partners the advantages that follow in its train, there have been inquiries and comments as to whether or not the Directors are not running a risk in, at this onerous time, making the reduction. The Chairman gave satisfaction on the point; and there is little doubt from what he says as to freights that, had the price of coal not risen again, to discount the benefit obtained from freights—that is to say, in contrast with current market rates—through the possession by the Company of their own steamships, the Directors could have retraced their steps in the matter of price to a larger extent than they have done. Through their own experience as shipowners, and carriers of their own coal, the Company have obtained first-hand evidence as to the outrage upon industry and the people by the unbridled licence of the shipowners in respect of their rates of freights for the transport of raw material and goods of all kinds. Freights for coal from the North to London were about 3s. per ton before the war; and they have been up to round about 15s. (with the sanction of the Government on them). And yet, meeting all expenses, including the capital charges for the purchase of the boats at war prices, the Company's transport costs only amount to 4s. per ton. When one considers that about 12,000 cubic feet of gas are made per ton of coal, it shows at once that only 1s. difference per ton in the rate of freight means 1d. per 1000 cubic feet. But other charges have gone up; and, notwithstanding the excellence of the returns from residuals, whatever the saving on freights *per se* (assuming the Company have at command enough boats of their own to carry all their coal), the Directors would not be in a position to do more than they are doing. As a matter of fact, their own freightage charge of 4s.—being 1s. above the pre-war rate—still represents 1d. per 1000 cubic feet greater cost; and, in considering reduction of prices, it is the pre-war rate with which comparison has to be made, and not the scandalous rates that the shipowners have been permitted to charge. As Mr. Carpenter says, this shipping business has been badly bungled, and should long ago have been properly regulated as it might easily have been.

As an analysis of accounts in other columns shows, the Company during the half year did exceedingly well with residuals; and here as in other places, in connection with gas supply, the Chairman had information to impart which must have struck the proprietors as illustrating the remarkable vitality of the gas industry, and its adaptability to the changing circumstances. Coke prior to the war had anything but a peaceful time. The South Metropolitan Company were particularly hard hit through it by the developments in another industry; but the progress of one industry cannot be stayed for the convenience of another. The advent of rotary kilns in the cement industry on the Medway deprived the Company of a lucrative market. They found a new outlet for their produce *viâ* the Scandinavian ports. A shortage of vessels arose. Again, fresh markets had to be sought; and home custom is now being developed with promising results—not with an eye only upon the present, but with one upon the future. Furthermore, still illustrating vitality and adaptability, the proprietors must have been gratified to learn how the war had brought the gas industry into special prominence as (it was an essential industry before) a super-essential industry—first, in respect of national safety, and, secondly, as the providers of raw material for other industries. Any crude use of raw coal means the destruction of products necessary to national security and national well-being and development. And so Mr. Carpenter sees no reason why the gas industry should not in the future become larger suppliers than is now the case of not only gaseous but solid fuel; and besides he cannot believe that the Government will allow the present system of burning raw coal to proceed unchecked. If they do, it will be detrimental to the country. There is something revolutionary in the idea; but all things that are revolutionary are not reactionary. The South Metropolitan Gas Company have frequently proved this through their initial work and influence on the progress of the industry. But fusing the gas and electrical industries—principally upon the ground of fuel waste by the latter—we fear, would be a bit too revolutionary for even this Government who have learned a good many things by bitter experience that have revolutionized their views. Mr. Carpenter seems halting between two opinions as to whether it would be the best thing for the two industries to join forces in the economic interests of the country. There is a great deal to be said on the point of the economical working and running of the two industries together; but there is little prospect of this now. Under the circumstances, the path of least resistance to the objective of fuel-saving would be for the Government to prohibit the electrical industry, after due notice, from using crude coal, and confining it for steam-raising purposes to gas or coke.

This leads up to the point that, if fuel waste is to be prevented, if in every direction there is to be improvement in the costs of production, if there is to be greater industrial development, there must be closer working harmony than there has been in the past between cognate industries, or industries with reciprocal relationships. For instance (the illustration is Mr. Carpenter's), how much value might have been saved in the past if tar producers and tar distillers had worked together on mutual lines—had collaborated, the one showing what was wanted, the other producing it. The gas industry is finding this out now that many of its undertakings are engaging partially or wholly in tar distillation, and have had to consider the question of quality of production in relation to distillation results. In this connection, Mr. Carpenter looks for good effects from the formation of the Association of Chemical Manufacturers, one of the objects of which is to encourage research in every kind of industry. With such an organization, supplemented by better organization in the gas industry—between the two industries Mr. Carpenter has become a living link—developments in processes, business, and relations ought to proceed to mutual advantage. From these indications, as presented by their Chairman, the proprietors of the South Metropolitan Company saw more than they could possibly have done from the traversing of a long continuous line of statistics, the directions in which the work of the industry is likely to expand; and they appreciated that the prospects were bright.

Low Manufacturing Costs at Widnes.

Gas engineers who were fortunate enough to have had modern and economical carbonizing plant available when war conditions arose, and so have not been compelled to work with uneconomical plant during these times of copious additional costs, have something for which to be exceedingly thankful; for economically working gas plant has, in many cases, done much, comparatively with the opposite conditions, to resist the full force of the unparalleled adverse circumstances. The question of economically working plant has an important bearing not only on the present, but on the future. It is clear that, for many a long year to come, expenses are going to continue high, relatively with pre-war times; and so the gas industry, with other industries, must not, even on the cessation of hostilities, look to obtain any immediate release from war effects. Those effects under our fiscal system will apply to all. But beyond the direct burdens of taxation, there will continue to be the

increased outgoings represented by the higher cost of materials and goods, the producers of which will also have their increased taxation as well as enhanced prices to pay for everything. The war has got to be paid for by the process of universal provision of the wherewithal. This process will be a terribly long and tedious one, unless the industrial work and trading of the country can be largely developed, and that with greater economy than hitherto. In this connection, there is much to be learned in the industrial world regarding the art of scrapping and the control of processes scientifically, before the ultimate possible economy and efficiency, even within the purview of contemporary knowledge, are reached. This applies equally to gas-works as to other manufacturing establishments. It would have been decidedly profitable for many gas-works to have long since scrapped and reconstructed much of their plant. That they did not do so is to their disadvantage to-day—to the disadvantage of the consumers, as well as, in the case of sliding-scale companies, of the stockholders. But there will perforce, owing to the present and prospective weight of costs, have to be hereafter greater attention to the work of modernizing than there has been heretofore—that is to say, as soon as there is liberation from existing capital and loan restrictions. Retribution of an unwelcome kind will follow any neglect.

These reflections accompany the study of some working particulars received from Widnes. The gas undertaking of that town cannot be accused of uneconomy; and, in truth, considering the price at which gas has been sold there for many years, one could entertain but little hope of more being extracted from the working in the way of economy, even by the aid of new plant. But Mr. Isaac Carr is of sanguine disposition; and those who remember the description he gave of his new carbonizing plant at the time it was formally inaugurated [see "JOURNAL" for June 30, 1914] will also recollect the confidence then disclosed as to the making of further impression in the way of economy upon carbonizing costs through the new machine-stoked, 24 in. by 20 in. by 20 ft., horizontal retorts. The confidence has been justified; and so, too, combined with efficient operation, has been the selection of plant. Economy, even upon the previous low-cost working, has been secured; and that economy has been, and is, valuable to the undertaking and to the consumers in these times of stress. If Widnes can realize economy upon their former state, there are not a few undertakings who could do likewise, and to a much larger extent. Looking at the comparative data, it is true that the average production of gas per ton of coal is not quite what Mr. Carr at first experienced, as given in his description of two years or so ago. He then spoke of 12,500 cubic feet of 17·8-candle gas, and 610 B.Th.U. Now for his last year's working, he reports 11,702 cubic feet per ton of 17·04-candle gas, but the calorific power is not stated. It is assumed that the illuminating power is by testings with the "Metropolitan" No. 2 gas-burner. Of course, the difference in production between the early days of the plant and now is no doubt due to a somewhat lower quality of coal being used. One cannot always obtain the quality selected in these days. The quantity of coke sold is good; the quantity of sulphate of ammonia and the tar is also subject to the quality of the coal, and the carbonizing conditions required by it in order to realize the over-all best results. But a figure of which Mr. Carr must unquestionably be proud is that of net manufacturing charges per 1000 cubic feet sold for last financial year—4·892d., as compared with 4·5d. for 1914-15—the figures including maintenance. When it is considered that the former figure embraces the abnormal rise in the cost of coal, it speaks volumes for the economical working of the horizontals.

The comparative table does not give the relative costs for coal nor receipts for residuals. But the bare figures suggest other comparison. Widnes and Sheffield are head and shoulders above all other gas undertakings in respect of lowness of charges to consumers; and it is interesting to note that "Field" for 1915 gives the net cost of coal in the case of Sheffield as 2·93d. per 1000 cubic feet sold, and other manufacturing charges as 5·10d. These figures make together 8·03d., or 3·14d. more than Widnes. Looking backwards, the difference between the two in respect of the total net cost of coal and other manufacturing charges appears to be widening in favour of Widnes, assuming that coal and all other prices approximately correspond. But when it is borne in mind that Sheffield, like Widnes, uses horizontal retorts to the exclusion of verticals, and that these two places have precedence in the matter of the lowness of the price of gas, we have there a point with which it would be interesting for our vertical retort advocates to deal, more particularly with reference to manufacturing costs. We therefore invite those users of vertical retorts who can give for them—free from all entanglement with the working costs of other carbonizing systems—the equivalent to the net coal and manufacturing costs received from Widnes. It will be remembered that, before Mr. Carr resolved upon horizontal retorts with machine working, he thoroughly investigated verticals, coke-oven plant, and modern machine worked retorts; and his conclusion was, without any qualification, in favour of the last-named. We congratulate him upon the 4·89d. in these difficult and expensive times; if coal prices had been anything like normal, with residuals at the good prices they are commanding, there would obviously have been a still more interesting result.

The consumers are also to be congratulated upon the continued lowness of the price of gas. They enjoyed supplies on the old terms right up to half of the past financial year, and then the price was advanced by only 3d. With this 3d. extra applying to only six months of the year, there was the (at the prices charged) excellent net profit of £2731. Of course, one cannot, especially in these times, penetrate far into the future; but the accounts show that, unless there is a further large increase in cost of coal, the 3d. advance in the prices of gas will satisfy all needs. The prices prior to the advance were 8d., 10d., and 1s. per 1000 cubic feet; they are therefore to-day 11d., 1s. 1d., and 1s. 3d. Widnes is lucky in its gas supply. It would have been luckier still had it not been for the war; for by the assistance of the new carbonizing plant, there was good chance of the prices being reduced to 6d., 8d., and 10d. Widnes gas prices are always envied; the consumers are envied beyond the urban borders; the Gas Committee and their Engineer are envied. The only consolation (if such it be) they can possibly find in not having been able to go down to 6d., 8d., and 10d. is that it has prevented any accentuation of that envy. The time, however, may yet come when these figures will be actualities, and when Widnes will cause the gas industry the world over to still further marvel. And horizontal retorts, machine-stoked with heavy twelve-hour charges, are preferred at Widnes!

Coal Grievances and Gas Undertakings.

MOVEMENT is being made, with proper and necessary promptitude, by the strong Committee of representatives of gas undertakings elected—on the initiative of Mr. Alderman Kay and Mr. Alderman Phillips—at a conference at Manchester on May 18 last, in regard to the subject of the grave position of coal supplies to gas-works. It will be remembered that the final words of the main resolution passed on that occasion were: "That the representatives present "be requested to communicate with their respective mem-"bers of Parliament to seek their assistance in bringing this "very important matter to an issue." This has been done, as a report in other columns discloses; and the sympathy and assistance of a number of members of Parliament have been enlisted, with the view to a thorough presentment of the case in the right quarters. Good reason existed before in not losing time in this matter. But stronger reason exists to-day, now that the Board of Trade, without listening to anyone but the South Wales coalowners, have granted them an additional 2s. 6d. on the 4s. standard (to supplement the basis price) granted under the Price of Coal (Limitation) Act, which action has stimulated the coal proprietors in other fields to try to obtain the same concession, though many of them, through abuse of the Act, have already assured themselves, under new contracts, of the equivalent of a substantial advance upon the 4s.

It was seen recently that the President of the Coal Miners' Federation (Mr. Smillie) had advanced figures with the object of showing that no increase of the standard 4s. is justified [*ante*, p. 149]; and these figures are not to be disposed of by the simple plan of generalization adopted by the District Coal and Coke Supplies Committee of South Wales and Monmouthshire. In their statement [as reproduced elsewhere] no data are given to support the action of the Board of Trade in allowing the addition of the 2s. 6d.; and business people outside will want something more than mere assertion in order that they may make investigation on their own account, and see whether or not there are in existence the satisfactory elements of a case

for the advance. It is only due to large customers of the coal industry that there should not be any secret interference with a parliamentary decree of the nature of this one, which means so much to the country at large. Of course, it does not follow that, even assuming so much as 2s. 6d. increase is legitimate for South Wales, any addition to the 4s. would be right for other coal areas. But there is uneasiness as to the future; for no one largely interested has failed to observe that, since the Limitation Act came into operation, there has been a good deal of indulgence towards the coal owners, and little attempt to frustrate those who have, by various ruses, practically rendered the Act nugatory. At the conference that the representatives of the Gas Undertakings Committee had on Thursday last with members of Parliament, evidence was advanced—particularly by Mr. Gover Ford, of Nottingham—showing this to be the case; and plenty more of the same kind of testimony could, if required, be readily submitted in confidence to the Board of Trade, and possibly in fuller detail. No one in the gas industry has seriously complained of the standard of 4s.; no one would complain at all, if it were loyally complied with, and the basis price of 1913-14 were fairly taken, and contractual obligations sincerely observed. Yet 4s. per ton means roughly to the gas consumers of the country £3,600,000—that is, based upon the last-issued Board of Trade returns relating to gas undertakings, which showed a coal consumption by statutory gas concerns of 16,684,087 tons in the year 1914-15, so that 18 millions would be a fair estimate to take for statutory and non-statutory concerns. If another 2s. 6d. were generally added to the 4s., this would mean an addition of £2,250,000, or in all £5,850,000. These are figures which alone, without any others, suggest that the Board of Trade ought not, without serious consideration and conference with all parties concerned, make any alteration of the 4s., and moreover it further suggests that, while 4s. is the legal addition, they ought to ensure adherence to it, by the exercise of every means in their power.

But the fear of an extension to other coal areas of the concession of 2s. 6d., or some other figure, is not the only matter the representatives of gas undertakings desire to discuss with the President of the Board of Trade. The members of Parliament with whom there was conference on Thursday were obviously impressed by the facts laid before them; and their desire to personally assist the objects in view was evidenced by their resolving themselves into a Committee for the purpose. The resolution that was passed points to an intention to seek the amendment of the Limitation Act, with the view to the removal of grievances under which coal consumers now labour. At the interview with the Board of Trade, it is hoped to secure the presence of the Minister of Munitions, whose influence, considering his knowledge of the work that the gas industry has been doing in the production of high explosives, ought to be valuable on its behalf.

Standardization of Gas-Fire and Gas-Cooker Tests.

In a letter in our "Correspondence" columns, Mr. Thomas W. Fletcher—bearer of an honoured name in the gas industry—suggests that, with the large change that is about to be made from illuminating power to calorific value as the standard of quality for gas, the time is particularly opportune for the standardization of tests for gas-fires and gas-cookers, in connection with which "the field for unreliable comparative tests is enormous." Mr. Fletcher has in view here something more than the provision of the necessary appliances for conducting tests. He wants the whole test prescribed, and that a plain, straightforward, all-round one—in fact, the simpler the better, provided it shows in which way the heat is utilized, and at the same time exposes the best features and the weakest points of the apparatus under test. He prefers that the tests should be arranged by one or more of the numerous societies of the gas industry in collaboration with the Leeds University, so that "there could be no question of collusion or influence from the manufacturers of such apparatus." We are in sympathy with the aspirations of Mr. Fletcher; but is there not already in existence a competent body for obtaining what is required? The Institution of Gas Engineers have a Gas-Heating Advisory Committee, the composition of which embraces representatives of the Institution, of the Society of British Gas Industries, the Leeds University, the Manchester University, and the Imperial College of Science and Technology. But the Committee are not hastening. They are engaged considering the relative merits of instruments for testing the radiation efficiency of gas-fires, and are at present sitting on a fence composed of radiometers and a bolometric method. They intend to sit there (apparently till the end of the war), so as to give all workers time to bring forward their views and experimental results. But, as said, the instrument for testing one feature only of gas-fires does not compass all that Mr. Fletcher has in view. Given the tests that he suggests, and with fires and cookers purchased only on the results of those tests, stimulus would be given to manufacturers, healthy competition would be promoted, and so would fair trading. He goes further with the idea in the direction of the appointment of an unbiassed Testing Committee, with a disinterested and trustworthy technical staff, to test all apparatus, and to issue certificates for economy, efficiency, and hygienic qualities. Certain it is that, with severe competition confronting, the gas industry in must future use not only low-priced heating gas, developing per cubic foot a useful number of B.Th.U. for the maintenance and extension of their business, but auxiliaries of such gas in the shape of the most efficient appliances that can be produced.

A Transfer of Patronage.

Not all gas undertakings on the sea coast or navigable waterways can afford to purchase and run ships for the conveyance of coal; and the location of some other gas-works, which receive coal partly by water and partly by rail, is not altogether favourable to the possession of colliers. This is, for example, the case of the South Suburban Gas Company; but the day will come when the site acquired on the banks of the Thames for new works will be developed; and then maybe it will pay the Company to become shipowners. The war and the greed of shipowners have presented the case for private shipowning in a new light; and various gas undertakings, having now become the possessors of ships of their own, shipowners will find that the course taken to enrich themselves during the time of national stress will have permanently deprived them of a considerable amount of tonnage. This is only what could be expected. High freights, too, have had another effect; and this is a matter that was referred to by Mr. Charles Hunt, in his interesting address to the shareholders, at the meeting of the South Suburban Gas Company on Friday. The increase in the cost of raw materials used by the Company last half year was £28,000; and the portion of the coal that was seaborne carried an average charge for freight of 15s. 1d. per ton. This and the experience of last year constituted a warning which could not with impunity be neglected. The Directors have taken heed of the warning; and for the current year the Company's contracts for coal supplies which formerly came from the North, have been contracted for in the Midlands. The coal will now all be railborne. The results are that Durham has lost this business, the shipowners have not the coal to carry (which perhaps is of general advantage), they will not pocket heavy rates of freight on the coal (which is to their disadvantage), and the Company will save a considerable sum.

Gas-Fires and Next Winter.

There is likely to be trouble next winter with coal supplies to householders and to industries and large establishments of all kinds. Not a few gas-works will suffer. But this very condition of universal shortage of raw fuel means that there may be an enlarged application for gas-fires. Among gas managers there will be mixed feelings over such applications, as it is opposed to the policy of a progressive industry to send away business if it can possibly be avoided; and yet, while in ordinary times the business would be welcome, it would be much the contrary with short and tardy coal deliveries. But it is just at such times, when coal is dear and householders are short of supplies, when there may be a rush of applications for fires. Those undertakings that think themselves safe in respect of coal should, therefore, take an early opportunity of informing householders as to the position, and as to the impossibility of fixing all the fires that will be applied for owing to the number of available fitters being so limited. They should also be told that the principle which must be followed is "First come, first served," and that those who make application at once stand the best chance to avoid disappointment. There are undertakings offering certain inducements for early connection.

Some do not charge any gas-fire rental for the summer months; others fix fires free until the winter season is here. Those who want gas-fire business—and all want it if coal supplies will allow—should take steps to get it at once, even though the thermometer ridicules, and perspiring householders smile. At least one prominent gas undertaking in London has circularized householders on the subject; and the message closes with the statement: "Coal should not be used in London, except for the manufacture of gas, as only by that means can the very valuable products so urgently needed for munitions of war be secured."

The Municipal Savings Bank Proposal.

A few months ago, a scheme was set on foot in Birmingham for the starting of a Corporation savings bank, with a view to assisting the working classes to put by something during a period when they are earning more money than usual, and at the same time helping forward the war finance policy of the Government. The idea could not, however, be put into practice without the granting of statutory authority; and accordingly the Municipal Savings Banks (War Loan Investment) Bill was introduced by the Treasury. This Bill was subsequently withdrawn, through opposition to it on behalf of the banking interests. The Lord Mayor of Birmingham (Alderman Neville Chamberlain) to whom the scheme owed its origin, thereupon set to work to get another Bill introduced which would not be likely to meet opposition of this character. The result was the Municipal Savings Banks (War Loan Investment), No. 2, Bill, which was presented by Mr. M'Kinnon Wood, supported by the Chancellor of the Exchequer and the Solicitor-General. This, as set out in the single operative clause, was for the purpose of facilitating the investment of savings in securities issued for the purposes of the present war. It provided that it should be lawful for any council to which the section applied [councils of boroughs and urban districts], with the consent of the Treasury after consultation with the Local Government Board, or in the case of Scotland with the Secretary for Scotland, to establish and maintain a savings bank, and to receive deposits, guaranteeing interest and repayment of principal; and for this purpose it permitted a charge on the rates or funds of the council, subject to specified conditions. The Bill was to have come up early last week for second reading; but owing to threatened opposition, it was placed on the postponed list. It was asserted that there was still a feeling among the bankers that the Bill ought not to be proceeded with; though the Chancellor of the Exchequer said he had received no representations on the subject. He saw the bankers before introducing the Bill, and had received a letter from their representatives to say they would not oppose it. Later it was intimated that, if opposition was manifested, the Bill would not be pressed; and there the matter remains, for the present at any rate. After all the trouble that has been taken over the scheme in Birmingham, it is not surprising to learn that this postponement of the second Bill was received with a good deal of surprise and disappointment.

Further Unemployment Insurance Scheme.

By an Act dated July 19 of this year, the provisions of the National Insurance Act of 1911, so far as they relate to unemployment insurance, have been extended, in connection with the present war, to every workman who is "engaged on, or in connection with, munitions work as defined by the Munitions of War Acts, 1915 and 1916 (except such classes of work as the Board of Trade may by order exclude), or is employed in a trade mentioned in the first schedule to the Act, and to his employer, as if the work on which he is engaged or such trade were an insured trade within the meaning of the principal Act." In the schedule referred to, there is a list of seven trades, which include the manufacture of ammunition, explosives, chemicals, oils, and metals, and the manufacture or repair of metal goods. These trades, the words already quoted from the Act show, come under the scheme in any event; and the Board of Trade have power to extend the provisions to workmen employed in any trade or branch of a trade where it appears to them that a substantial amount of munitions work or other work for war purposes is being carried on. The Act will come into force on Sept. 4; and liability to pay contributions under it will be limited to such time as the Board of Trade may determine, "not being later than five years after the commencement of the Act or three years after the termination of the present war, whichever of these dates may be the later." It is stated that at least a million-and-a-half of men and women workers will be affected, and that the financial arrangements which have been made will safeguard the accumulated fund of the existing insured trades (affecting about two-and-a-half million workmen), which amounts to between £6,000,000 and £7,000,000. Anyone who may be in doubt as to whether a particular trade is or is not included in the new Act, is recommended to apply to a Labour Exchange; or an appeal for a definite decision may be made to the Umpire. This official may look forward to a busy time. The Board of Trade notify a number of applications received by him for decisions as to whether or not contributions are payable. Among these queries is noticed the manufacture of coke and the recovery of bye-products. Representations with regard to the applications may be made in writing to the Umpire by workmen or employers concerned, or persons claiming to be interested may apply to be heard by him orally. As indicating one direction at any rate in which the new Act comes into touch with the gas industry, it may be pointed out that the Umpire has already decided that contributions are payable in respect of workmen engaged in the repair (including cleaning) of gas-cookers, gas-fires, gas-boilers, and gas-radiators, and in the repair of gas-fittings; also all workmen engaged in the manufacture of cisterns and hot-water cylinders.

The Working Value of Women.

What in the gas industry is the working value of a woman compared with that of a man? The South Metropolitan Gas Company are employing a large number (some 400) in all sorts of occupations—chemists, draughtsmen, meter and stove repairers, engine cleaners, lamp trimmers, burner attendants, and in many other capacities. Those in responsible position in the Company ought therefore to be in the position to judge well as to the working value of women in comparison with that of men. Mr. Charles Carpenter, at the Company's meeting last Wednesday, stated that (although he would not have this used as a hard-and-fast rule) it might be taken, generally speaking, that the women were capable of about two-thirds of the work of a man in the same time; and the Company have used this as the basis of pay—that is to say, they make the wages exactly proportional to the work done when compared with male labour. So that the women receive two-thirds of the wages of the men for the same class of work. This is a very fair method; and, by it, the Company get the same amount of work done for the same amount of pay. The women have entered into co-partnership with the same spirit and earnestness as the men.

New Gas Association in Texas.—The Texas Gas Association has been formed, with the excellent object of furthering the growth of the gas industry in that part of the country, and of promoting a better understanding between employers and employees. Mr. M. T. Walker, the Manager of the Beaumont Gas Company, has been made President; and the first regular meeting of the Association will be held in October at Fort Worth.

A Calorific Standard for St. Louis.—An agreement has been come to between the Laclede Gas Light Company and the Municipality which permits tests of gas in St. Louis to be on the basis of heat units instead of illuminating power. In consideration of this change being made, the Company have agreed to reduce the price of gas 5 c. per 1000 cubic feet—a concession which is calculated to represent about $240,000 annually to the consumers.

Growing Dye Industry in the United States.—It is believed by well-informed authorities that by the year 1917 the bulk of artificial dyes consumed in the United States may be made in American works, from American raw material, by American labour. At the time the war broke out, the States were making about 3300 short tons of dyes, and importing 25,700 tons, of which 22,000 tons came from Germany; while present estimates indicate that there are already being made more than 15,000 tons of artificial colours from American coal tar.

History of the Safety Lamp.—The investigations undertaken during the past century and more in connection with safety lamps for coal mines were detailed by Professor F. W. Hardwick, M.A., and Professor L. T. O'Shea, M.Sc., in a paper read at the last meeting of the Institution of Mining Engineers. The authors described the lamps devised by Dr. Clanny, George Stephenson, Sir Humphry Davy, Upton and Roberts, Mueseler, Marsaut, and others, including the more modern types invented down to the end of 1913—this period being taken as covering a hundred years, inasmuch as they regard the history of the safety lamp as having commenced in 1813, though the Davy lamp was not invented till towards the close of 1815.

OBITUARY.

The death has taken place of Mr. HENRY RUTHERFORD, who for forty years was Manager of the Aberlady (Haddingtonshire) Gas Company.

Mr. ALBERT MASSEY, who was for many years with the Manchester Corporation Gas Department, has unhappily lost his life through drowning at Towyn, while engaged in pluckily saving the life of a bather. While resting on the shore Mr. Massey heard a girl call for help, and going to her assistance he brought her some distance towards the land. The girl was then heard to cry again, and when further help came, both were brought to the shore. She was saved, but Mr. Massey, who had apparently first become unconscious, was found to be dead. He entered the service of the department as an assistant chemist as long ago as 1882, and was attached to the Gaythorn works. In 1890 he was promoted to be Chemist, and remained in this capacity till 1898, in which year he was appointed Manager of the Droylsden Gas-Works. He occupied this post at the time of his death, at the age of 53.

PERSONAL.

Mr. JAMES HEMPTON, the Gas and Water Manager at Newtownstewart, co. Tyrone, has resigned, owing to ill-health.

The Deputy Water-Works Engineer at Bradford, Mr. JOHN WEBSTER, has been presented by the members of the local Municipal Officers' Guild with an illuminated address conveying congratulations on the attainment of his jubilee of service with the Corporation.

In the "JOURNAL" for July 25, p. 154, it was announced that Mr. H. HOLLIDAY (one of Mr. Farquhar's assistants at the Ilford Gas-Works) had passed First Class in Grade I. in the "Gas Engineering" Examinations of the City and Guilds of London Institute. We have since learned that Mr. Holliday has been awarded the second prize and a bronze medal of the Institute in connection with the examination.

News is just to hand that Lieutenant JOHN HOLLIDAY, R.E., is again in a Military Hospital suffering this time from a gunshot wound in the thigh, inflicted during the recent British push in the Somme attack. The injury, though painful, is we are glad to learn "quite mendable." We understand that this is Lieutenant Holliday's third "casualty"—one of the previous occasions being noted in the "JOURNAL" for Oct. 19 last year.

Last Tuesday, at a special meeting of the Morecambe Town Council, Mr. R. H. RUTHVEN, Assistant Gas Engineer to the Ramsgate Corporation, and formerly of Kendal, was appointed Gas Engineer and Manager, at a commencing salary of £200. The Morecambe vacancy occurred through the appointment of Mr. Harold Clapham to Redcar. In the early part of this year, there appeared in the "JOURNAL" an illustrated article by Mr. William Thomson and Mr. Ruthven descriptive of their "T. R. Sprayoil" apparatus for the prevention of naphthalene troubles on the district.

GAS SUPPLY OF PARIS.

A Whole War-Time Year.

THE report of the Directors of the Paris Gas Company for the twelve months ended Dec. 31, 1915, has been considerably delayed in publication, and even now reaches us semi-confidentially and on the understanding that parts of it considered of value to the enemy should not be repeated in the Press. It will thus be recognized that, in acquiescing in the wishes of our French friends, we necessarily forgo including in our report of the Company's working during 1915 many items which we have been accustomed to record. The period which is the subject of the present report is a full twelve months of war—that preceding it, and reported in the "JOURNAL" for Nov. 23 last, p. 444, having represented only five months of hostilities. Many things have happened, exceptional difficulties have been met, and special services have been rendered; hence it is only natural that we should desire to confine our report to such details as cannot directly or indirectly be of service to the enemy.

The total quantity of gas sent out from the works was 347,801,235 cubic metres (about 12,238 million cubic feet), compared with 412,988,336 cubic metres (14,585 million cubic feet) in 1914. The day consumption amounted to 185,297,850 cubic metres (6544 million cubic feet), against 200,352,190 cubic metres (7075 million cubic feet) in 1914.

The number of consumers on the books at the end of 1915 was 716,065—an increase of 453 over those on record at the end of 1914. The year also witnessed an increase in the number of lamps installed for the public lighting of the city—viz., 64,988, as compared with 63,872 on Dec. 31, 1914. Of these, 1215 were open-flame burners; the remainder, 63,773, incandescent lamps. There has been a further increase in high-pressure lighting. The number of centres on Dec. 31 last was 2002, against 1874 twelve months previously; the respective total candle-power being 3,787,000 and 3,583,000. As a result of lighting restrictions, the number of centres in actual use is very substantially less than in the previous year.

The number of rising pipes for tenements also shows an increase during 1915—viz., 158. The total at the end of the year was 59,386, representing 586,981 consumers—a gain of 1502. The length of the Company's mains at the end of 1915 was 2116·032 kilometres (1315 miles), an extension of 20·643 kilometres (12¾ miles) beyond that of 1914.

As regards the financial position of the Company, it must be sufficient to refer to items which have laid quite exceptional burdens upon the undertaking. Servants of the Company called up for military duties have been treated as municipal employees, and have been paid their customary salaries in full—an unproductive expenditure which in 1915 amounted to 16,444,000 frs. (£657,700). The phenomenal advance in the price and freightage charges for coal has been another exceptional feature of the Company's expenditure.

Prices for sulphate of ammonia have been firm; the product being in demand for agricultural and munition purposes. The same remark applies to tar oils and pitch. The Company have been the first in France to undertake the extraction of benzol from gas for purposes of national defence. They have also applied themselves very extensively to the use of gas as a source of heat in industrial processes connected with the war. They are pursuing these developments, and are looking forward to a permanently increased demand after the war for gaseous fuel in industrial operations. Already in bakeries, kitchens of restaurants, hospitals, &c., extended and satisfactory use has been made of gas-heated stoves in substitution of those employing solid fuel.

During the year substantial progress has been made in extensions and rebuilding of the Company's plant, despite great difficulties in the way of scarcity of labour and material.

ELECTRICITY SUPPLY MEMORANDA.

"THE door has closed upon the past. The Council of the Institution of Electrical Engineers has adopted a new and active policy; and we hope a new era has dawned for the electrical industry in this country." These are words of the "Electrical Review;" and they ring with confidence and hopefulness as to the future of the electricity supply industry.

Investigating Committees and a New Era.

We are not altogether clear how or why the door has closed upon the past. The electric industry has, we know, a "past." In some respects, it is a past that is not at all an unpleasant one, but, in other respects, it is not altogether creditable, owing to the several years spent by the industry in the attempt to mend and increase its fortunes by vilifying the gas-supply industry. However, as we have lately seen, the electric industry has been greatly heartened by the appointment of the Board of Trade Electricity Committee, and the signs of an awakening at the headquarters of the Institution of Electrical Engineers. Electrical men appear to have suddenly become very much enamoured of committees. There is now additional rejoicing over the fact that other committees have been appointed, and that they have come to an agreement as to lines of co-operative working. With all these Committees looking after the interests of the electricity supply industry, something surely ought to happen that will be advantageous. One of the Committees is that of the Institution of Electrical Engineers, which was originally appointed to consider the present and future position of electricity supply in Great Britain; and there is also a Joint Committee of the Incorporated Municipal Electrical Association and of the Incorporated Association of Electrical Power Companies. Both these Committees are desirous of securing the maximum of benefit from their labours. They do not want to overlap in their investigations and functions, and to wastefully expend time and talents through being simultaneously engaged upon the selfsame work. Therefore, the Committee of the Institution have agreed to concentrate attention upon the question of electricity supply from the point of view of the requirements of the country as a whole, and will deal with the engineering aspect of the matter; while the Joint Committee will devote themselves to the immediate question of organization and linking-up of the existing undertakings.

Drastic Schemes Wanted.

With all these guardians of the interests of the electric industry at work, and investigations into problems associated with development, something should issue that will have beneficial result. But while our friends may hope for this, it would be a bit premature to poetically describe these Committee appointments as constituting the dawn of a new era for the electrical industry. The work the Committees have before them appears to be largely due to imprudent and chaotic administration in the past; and that their services should be needed now is not altogether complimentary to those who have been directing the fortunes of the industry. The "Electrical Times" thinks that something drastic must be recommended by the Committees, which is confirmation of the view that there has been muddled and indifferent management in the past. Still, out of it all, the

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View of tops of recently constructed Sulphuric Acid Chamber Plant.

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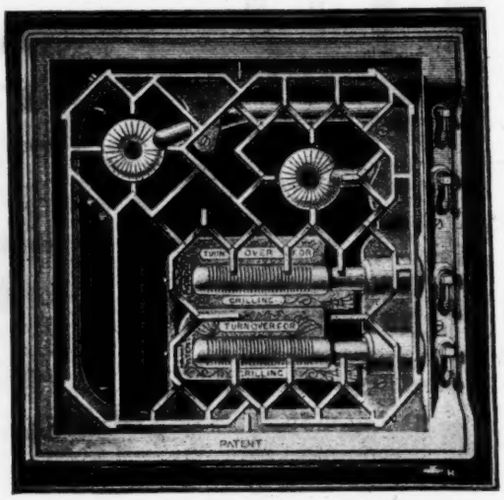

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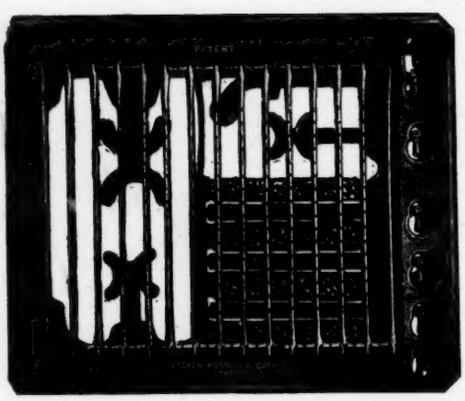
It was discarded in favour of our
PATENTED VENTILATED GRIDS,
which have been supplied with all our Standard Cookers for the last 29 years with

PERFECT SATISFACTION.



Plan of Hotplate of our No. 170 Standard Cooker, showing Ventilated Grids referred to above.

Illustration of Hotplate of our "HOUSEWIFE" Cookers showing revised Ventilated Grids and Patent Arrangement for holding same upright for cleaning purposes.

Palatine Works,
WARRINGTON.

National Buildings,
St. Mary's Parsonage,
MANCHESTER.

15, Fisher Street,
Southampton Row,
LONDON, W.C.

"Electrical Review" considers there is reason to hope that the deliberations of the Committees will be fruitful. Although the work of these Committees is split-up in the manner described, it is a broad inquiry upon which they are entering; but there are those among our electrical journalistic friends who seem to want to ensure that certain things are investigated. For example, in connection with linking-up schemes, the "Electrical Review" is desirous that the obtaining of wayleaves shall be promptly considered; while "Electrical Industries," assuming that the Institution Committee will discuss the design and location of large central power stations, will look into the fundamental question of coal conservation. This would bring the Committee "in touch with problems that have hitherto lain outside the daily work of the central station engineer—problems of chemistry, of gas manufacture, and of co-operation with collieries." This is a bit too big for even the "galaxy of *all* the talents" that the "Electrical Times" finds in the composition of the Committees; for "Electrical Industries" opines that the Institution may find itself called upon "eventually to consult with other bodies before a sound and comprehensive plan for the utilization of coal resources can be drawn up." There is a little uncertainty as to what is really meant here. Does our contemporary consider that representatives of an industry which has shown such poor thermal efficiency in relation to the coal consumed, and has destroyed annually a considerable quantity of valuable constituents of coal, are capable of conceiving and maturing a "sound and comprehensive plan for the utilization of coal resources?" Up to the present, they have not through their practices disclosed their fitness for so doing. We take it that the idea comprehends the uprooting of industries that have hitherto made a greater economic use of coal than is the case in the generation of electricity. But before insane notions (if there is the liability of this occurring) get the Committees into their grip, perhaps the members would just do the gas industry the honour of looking over the wall at what is produced per ton of coal in its works. Peradventure they would get a few tips from the gas industry's practices; also when it is seen what is involved in separating coal into its constituent parts, and then dealing with these parts by different processes, it may be conceded by the Committees that the shortest cut to aiding in fuel economy and the conservation of coal is to utilize under the boilers of generating stations coke, which is one of the products of the scientific carbonization of coal.

Linking-up and Other Matters.

The one objective of all the work that the electricity industry is contemplating through these Committees is the cheapening of supply. Although bye-product recovery—the nitrogen of the coal, the tar, the oils, &c.—is one of the plans, there is not a large chance of success in this direction—particularly immediate success. The more likely methods are through working for economy with existing plants, utilizing waste heat wherever possible, and minimizing spare plant as far as may be, through the much-talked-of process of linking-up distribution systems. In this linking-up, central station engineers foresee excellent economies, and the elimination to a large extent of the inconvenience and dissatisfaction produced by breakdowns. It will also facilitate shutting-down during night time and during light loads, and afford joint facilities in respect of overhauling and repairs. The more central station engineers have studied the matter, the greater appear to be the possible economies. Though the advocates of bulk supply are somewhat afraid that linking-up means a set-back to their aims and ambitions, and the perpetuation of those many small stations which they allege ought to be extinguished, naturally those responsible for urban electricity supply have to consider present conditions in respect of generating plants, rather than those that may arise later on. And, as a matter of fact, the claims of bulk supply have been materially nullified by the more economical conditions introduced to the local generating stations by the steam-turbine. They have also to consider, as the gas industry must do, the demands that will be made in connection with the plans for industrial expansion that is to follow on the re-establishment of peace. This expansion can wait for no man, nor for the development of electricity bulk supplies. Delay means the enemy's advantage, and this country's disadvantage. The work that the industries have to take in hand is the increase of our exports, and the reduction of our imports. The more this is done the better, and the greater our prosperity. The suppliers of light, heat, and power have their large part to take in this work. A few enthusiasts think the electricity industry can alone undertake all that is required in this direction. We of the gas industry have no such feelings. But we do pride ourselves upon being already prepared to supply gas for light, heat, and power; gas and coke for generating electricity; coke for heating where solid fuel is preferred; tar products for dyes and colours, for explosives, and for organic chemical compounds; tar oils for motor fuels; and an excellent fertilizer. Some people in the electrical industry pretend they know nothing of this diverse work of the gas industry, which is a confession of lamentable ignorance that would sit better on a Judge of the High Courts than upon a practical electrical engineer.

Equipment for Small Stations.

Small electric generating stations have lately been favoured by a large amount of attention. Some people would like to extinguish them as quickly as possible; but they see the impossibility of doing so until a great cobweb of transmission wires cover the land, into which cobweb is fed the product of the colossal generating-stations, which the visionaries have fore-ordained are to be erected at the coal-pit heads. The point that the capital that would have to be sunk in transmission lines would be immense, and would swamp the low generating costs, is apparently too insignificant a matter for consideration by the visionaries, and so, too, is the increased danger of an interruption of supply. But about small plants, many people find it much cheaper and safer, when their individual requirement for electricity is on a substantial scale, to have their private generating plants, which, taking the average cost per unit for any purpose, will defy the prices that the distributors of current offer to supply at. However, as Mr. George Wilkinson, writing in the "Electrician," says, the small central generating station will continue to be called for; but the total revenue will be of a character which will need the greatest of economy in capital expenditure, in running costs, and especially in supervision and labour. The "Electrician," in a leading article upon the subject, remarks that for a small station the plant must be of an extremely simple character, and Mr. Wilkinson's article confirms this. But a curious thing is that, while there are now so many private generating sets driven by reliable town gas, and giving satisfaction, neither Mr. Wilkinson nor our contemporary refers to town gas as a generating agent. With it no boiler-house, no coal or oil storage, no producer plant, which, in any case, according to the plant adopted, means capital expenditure, more plant to maintain and eventually to renew, more labour, more complication, more responsibility. The costs and responsibility with the town-gas fed engine only begin at the gas-tap. There is no question as to the provision of fuel. The responsibility for this is taken by the town-gas purveyors. The fuel is there. Could anything be more delightfully simple? However, Mr. Wilkinson is unfavourable to steam equipments in small power units with separate boilers. They are too wasteful of fuel, and heavy in labour charges, for successful operation at tariff rates attractive to customers. Gas-engines, with producer plants, have been used; but Mr. Wilkinson is not aware of any continued success having been made with this class of plant, but has frequently heard loud complaints of their unreliability in operation, with the rapidly varying loads met with in electric generating stations. As to Diesel plants, the expected advantages from the small station so equipped have not been fully realized, due to the necessity for employing specially skilled labour to run and repair the plant, to the expensive repairs, and to the liability to sudden breakdown. He thinks the mechanical troubles met with in Diesel engines fully justify the existence, and continued activity, of the Diesel Engine Users' Association. Recently he has seen photographs of a fractured crank web taken from a Diesel engine of modern manufacture; and the repair involves the provision of a new crank shaft at a cost of not less than £1000. Further, the vagaries of the petroleum fuel oil market do not produce the most pleasant sensations for users of Diesel plant.

The "Locomobile."

We come to the kernel of interest in Mr. Wilkinson's article. He advocates for small central stations steam plant of the "locomobile" type, with which other forms of equipment, in his opinion, cannot compare favourably in capital cost, ease and reliability of operation, smallness and cheapness of buildings required, or in economy of fuel and labour. The equipment consists of superheated steam semi-stationary compound condensing engines, driving direct current generators, direct-coupled, or driven by means of steel belts. Due to the efficiency of the plant, and its small demand for steam, he says, the necessary water-cooling plant is surprisingly small and cheap. No separate boiler-house, and no expensive foundations, are necessary. The plant is all in one room; so that the labour requirement is low. Such a plant is in operation at Ilkley. But the works have had to be inaugurated under the adverse conditions due to the war, which has both increased the capital cost and greatly reduced the number of immediate customers. The station was opened for public supply in January last; and official tests have given these results:

	Cost (Coal 21s. per Ton) per Unit.
At 25 per cent. overload, 2·9 lbs. of coal per kilowatt-hour	=0·324d.
On full load of 130 KW., 2·24 lbs. of coal per kilowatt-hour	=0·25d.
On half load [calculated], 2·61 lbs. of coal per kilowatt-hour	=0·291d.

Mr. Wilkinson believes that, when normal times return, the plant will demonstrate a higher economy in running and successful financial results. The trouble that we should anticipate with a "locomobile" plant—the engine being perched on the top of the boiler—is that, on the lighting-up or cooling-down of the boiler, the engine will be thrown out of line; and this will not conduce to steady running.

The forty-sixth annual meeting of the District Association of Gas and Water Engineers of Silesia and Lusatia was announced for the 4th to the 6th inst., at Bad Reinerz, in Silesia, under the presidency of Herr Hofmann, of Oppeln.

The War Trade Department is now prepared to consider licences for the export of solvent naphtha (provided that it contains less than 5 per cent. of toluol) to the British Colonies, America, and the allied countries with the exception of France.

COMPARATIVE WORKING RESULTS OF THE THREE METROPOLITAN AND THREE OF THE SUBURBAN GAS COMPANIES.

IN THE HALF YEAR ENDED JUNE 30, 1916.

Compiled by Mr. F. J. BRADFIELD, the Secretary of the Commercial Gas Company.

	Gas Light and Coke.	South Metropolitan.	Commercial.	Wandsworth.	South Suburban.	Tottenham.
Gas sold . . . . . thousands	13,714,244	6,674,289	1,770,095	1,291,210	1,158,477	1,313,659
Increase . . . . . per cent.	1·94	0·72	1·03	1·97	4·39	11·34
Gas made per ton of coal . . . . . cubic feet	12,733	12,249	13,933	13,124	12,968	12,201
„ „ per gallon of oil . . . . . „	477	..	500	455	510	574
Gas unaccounted for . . . . . per cent.	6·49	2·73	7·75	5·24	4·02	4·78
Coke made for sale per ton of coal . . . . . cwt.	9·75	9·32	11·52	11·53	9·61	9·16
Tar made per ton of coal . . . . . galls.	9·83	10·12	11·28	9·38	10·16	..
Liquor made per ton of coal. . . . . galls, 8 oz.	35·75	41·15	40·09	36·23	31·76	..
Percentage of coke used as fuel	20·62	24·73	11·34	7·78	25·46	26·81
Capital expended per 1000 cubic feet sold during the past year	s. d. 10 10·89	s. d. 8 6·20	s. d. 8 5·97	s. d. 7 8·78	s. d. 9 7·78	s. d. 8 4·68
Price charged per 1000 cubic feet	3/0 and 2/10	2/10	2/8	2/1 to 3/1	2/10 to 4/7	2/3 and 2/11
Costs per 1000 Cubic Feet of Gas Sold.						
REVENUE ACCOUNTS.	d.	d.	d.	d.	d.	d.
Coals, oil, &c.	22·48	24·95	21·01	19·97	24·85	20·62
Less residuals—Coke and breeze	8·33	10·70	8·11	9·22	8·66	6·36
Tar	2·35	2·88	1·25	1·49	1·30	1·13
Amm. liq. and sulph. amm.	2·59	2·80	2·39	2·07	2·13	0·99
Total residuals	13·27	16·38	11·75	12·78	12·09	8·48
Net for coals, oil, &c.	9·21	8·57	9·26	7·19	12·76	12·14
MANUFACTURE—						
Salaries	0·30	0·74	0·51	0·29	0·56	0·28
Wages—carbonizing	1·95	1·92	1·63	1·90	1·28	2·12
Purification	0·23	0·69	0·17	0·21	0·26	0·39
Repairs—plant	5·20	4·97	3·86	5·03	3·25	3·21
Net manufacture	16·89	16·89	15·43	14·62	18·11	18·14
DISTRIBUTION—						
Wages and salaries	1·14	0·83	0·84	1·23	1·49	0·80
Repairs—Mains and services, &c.	1·92	1·18	1·42	2·02	1·74	1·88
„ Meters and prep. meters and fittings	2·04	2·93	1·91	1·06	2·51	1·70
„ Stoves—ordinary and prepayment	1·97	1·49	1·55	1·74	2·69	1·06
Total net manufacture and distribution	23·96	23·32	21·15	20·67	26·54	23·58
Public lamps—lighting and repairing	0·51	0·54	0·40	0·47	0·55	0·31
Rents, rates, and taxes	2·93	2·07	1·79	1·23	1·89	1·19*f*
MANAGEMENT—						
Directors, Auditors, and salaries (Secretary, &c.)	0·25	0·24	0·34	0·53	0·76	0·43
Collectors	0·54	0·64	0·79	0·48	0·53	0·46
Stationery and general charges	0·29	0·62	0·63	0·62	0·39	0·35
Profit-sharing	0·08	0·28	0·30	0·36	0·26	0·43
Bad debts	0·09	0·06	0·02	0·08	0·04	0·01
Law and parliamentary charges	0·01	0·04	0·01	0·00	0·00	0·10
Superannuations, &c.	0·47	0·62	0·34	0·37	0·52	0·32
National Insurance	0·07	0·10	0·07	0·08	0·06	0·05
Active service allowances and war bonus	0·13*a*	1·56	0·36*a*	1·59	1·30	1·12
Sundries	0·04	0·04	0·01	0·02	..	..
Total expenditure (*less* residuals)	29·37	30·13	26·21	26·50*d*	32·84	28·35
GAS	35·33	33·59	30·69	28·84	37·06	27·82
Rentals—Meters and prep. meters and fittings	2·93	3·36	2·79	2·80	2·25	1·79
Stove	1·43	1·41	1·86	2·46	1·86	4·18
Incand. mantle maintenance	..	..	0·11	0·12	..	0·08
Miscellaneous	0·12	0·05	0·00	0·03	0·04	0·07
Total—Gas, rentals, &c.	39·81	38·41	35·45	34·25	41·21	33·94
Balance, being profit	10·44	8·28	9·24	7·75	8·37	5·59
Dividend and interest	9·76	6·78	8·06	6·74	7·04	6·14
Surplus	0·68	1·50	1·18	1·01	1·33	Def. 0·55
Contributions to funds and sundry payments	0·09*b*	0·72*c*	..	0·25	..	0·79*g*
SUNDRIES.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Coals cost per ton	24 7·66	24 4·64	25 6·38	22 0·15	..	23 4·43
Coke realized per ton of coal	9 11·07	10 4·85	12 4·47	11 3·16	10 0·99	8 6·78
Coke „ „ of coke.	20 4·25	22 3·81	21 5·64	19 6·51	20 11·81	18 8·34
Breeze „ per ton	4 10·81	0 11·19	4 6·98	3 4·22	2 3·18	2 5·80
Tar realized per gallon	0 3·65	0 3·34	0 1·84	0 2·25	0 1·81	0 1·54
Amm. liquor, &c., realized per butt (8 oz.)	9 11·65	7 2·04	10 0·62	7 10·73	8 6·02	..
Percentage of stoves at rental to consumers	83	100	73	93	101	71
Bad debts per cent. on total receipts	0·17	0·11	0·04	0·18	0·08	0·3
Net profit per cent. on ordinary capital	4·68	5·66	5·70	7·10	6·02	5·33*h*
One penny variation equals in half year	£57,143	£27,809	£7375	£5380	£4827	£5473
Carb. water gas, per cent. on total make	23·21	..	32·57	20·44	12·83	30·98

a Active Service Allowances only.
b Redemption Fund.
c Insurance Fund.
d Capital Duty eliminated.
e Capital Duty.
f Rent and Rates only.
g Income-Tax.
h Including Electricity Results.

COMPARATIVE WORKING RESULTS OF THE THREE METROPOLITAN AND THREE OF THE SUBURBAN GAS COMPANIES.

TABLE SHOWING THE VARIATION, INCREASE OR DECREASE, ON FIGURES OF CORRESPONDING HALF YEAR, 1915.

[The figures in heavy type show the decreases.]

Compiled by Mr. F. J. BRADFIELD, the Secretary of the Commercial Gas Company.

	Gas Light and Coke.	South Metropolitan.	Commercial.	Wandsworth.	South Suburban.	Tottenham.
Gas sold . . . . . thousands	260,491	47,566	17,994	24,995	48,791	133,829
Increase (variation equal to) . . . . . per cent.	6·25	4·45	**1·20**	2·78	4·33	9·84
Gas made per ton of coal . . . . . cubic feet	**311**	69	**86**	**302**	**42**	**610**
,, ,, per gallon of oil . . . . . ,,	66	..	46	6	53	188
,, unaccounted for . . . . . per cent.	1·07	**·53**	·95	**·32**	**·63**	**1·60**
Coke made for sale per ton of coal . . . . . cwt.	**·13**	·30	·56	·18	**·63**	**·02**
Tar made per ton of coal . . . . . galls.	**·64**	**·65**	·08	**1·09**	·57	..
Liquor made per ton of coal . . . . . galls, 8 oz.	**2·34**	·59	1·11	**·30**	**4·93**	..
Percentage of coke used as fuel	·56	**1·91**	**·94**	**1·39**	3·92	2·11
Capital expended per 1000 cubic feet sold during the past year	s. d. 0 0·293	s. d. 0 2·20	s. d. **0 0·79**	s. d. 0 1·37	s. d. **0 2·91**	s. d. **0 4·56**
Price charged per 1000 cubic feet†	..	..	..	0 4·00	..	0 3·00
Costs per 1000 Cubic Feet of Gas Sold.						
REVENUE ACCOUNTS.	d.	d.	d.	d.	d.	d.
Coals, oil, &c.	6·75	3·50	5·47	3·77	5·01	4·00
Less residuals—Coke and breeze	3·22	3·04	3·65	3·66	·92	1·78
Tar	1·08	1·06	·05	·23	**·11**	**·16**
Amm. liq. and sulph. amm	1·13	**·57**	·93	·84	·43	·13
Total residuals	5·43	4·67	4·63	4·73	1·24	1·75
Net for coals, oil, &c	1·32	**1·17**	·84	**·96**	3·77	2·25
MANUFACTURE—						
Salaries	·02	·05	·04	**·03**	**·03**	**·02**
Wages—carbonizing	·37	·10	·12	·13	·00	·81
Purification	·00	·00	·03	·05	·15	·11
Repairs—plant	·92	1·32	·47	1·02	**1·27**	·00
Net manufacture	2·63	·30	1·50	·21	2·62	3·15
DISTRIBUTION—						
Wages and salaries	·04	·04	·02	**·09**	·02	**·10**
Repairs—Mains and services, &c.	·31	·01	·08	**·49**	**·12**	**·69**
,, Meters and prep. meters and fittings	·21	1·11	**·10**	·18	·36	**·09**
,, Stoves—ordinary and prepayment	·22	·49	·03	·31	·87	**·18**
Total net manufacture and distribution	3·41	1·95	1·53	·12	3·75	2·09
Public lamps—lighting and repairing	·05	·02	·05	**·01**	**·13**	**·06**
Rents, rates, and taxes.	**·20**	·01	**·63**	·08	·03	**·83**
MANAGEMENT—						
Directors, Auditors, and salaries (Secretary, &c.)	·01	**·03**	·01	**·01**	**·01**	**·05**
Collectors	·04	·00	·06	·02	**·01**	·00
Stationery and general charges	·05	·02	·18	·15	·07	**·03**
Profit-sharing	**·15**	**·38**	**·07**	**·14**	**·36**	**·26**
Bad debts	**·04**	**·02**	**·02**	·01	**·01**	**·03**
Law and parliamentary charges	·00	**·01**	·00	·00	**·03**	·07
Superannuations, &c.	**·02**	·18	·00	**·02**	**·04**	**·04**
National Insurance	·00	·03	·00	·00	**·01**	**·02**
Active Service Allowances and War Bonus	·00	·92	·36	·65	·74	·43
Sundries	·00	·01	·00	·02	..	..
Total expenditure (*less* residuals)	3·15	2·70	1·47	·87	3·99	1·27
GAS	2·24	4·09	2·01	2·40	3·28	2·82
Rentals—Meters and prep. meters and fittings	·05	·02	**·13**	·04	·01	**·17**
Stove	·05	·03	·11	·16	·19	·27
Incand. mantle maintenance.	..	..	·00	**·02**	..	**·04**
Miscellaneous	·01	**·01**	·00	**·03**	**·04**	·03
Total—Gas, rentals, &c.	2·35	4·13	1·99	2·55	3·44	2·91
Balance, being profit	**·80**	1·43	**·52**	1·68	**·55**	1·64
Dividend and interest	**·14**	·28	**·06**	·06	**·24**	·03
Surplus	**·66**	1·15	**·58**	1·62	**·31**	1·61
Contributions to funds and sundry payments	**·33**	·50	..	**·11**	..	·74
SUNDRIES.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Coals cost per ton	5 3·31	3 7·07	6 1·47	3 0·46	..	4 4·05
Coke realized per ton of coal	3 0·01	3 3·44	5 1·35	3 5·05	0 1·71	2 0·32
Coke ,, ,, of coke	6 4·02	6 6·44	8 2·74	5 8·73	1 6·79	4 4·71
Breeze ,, per ton	**0 11·68**	**4 9·46**	0 6·06	1 5·38	..	0 7·92
Tar realized per gallon	0 1·44	0 1·10	0 0·02	0 0·35	**0 0·47**	**0 0·06**
Amm. liquor, &c., realized per butt, 8 oz.	3 8·04	1 5·05	3 2·72	2 6·81	2 0·59	..
Percentage of stoves at rental to consumers	2	2	3	3	5	4
Bad debts per cent. on total receipts	**·11**	**·07**	**·06**	·00	**·03**	**·07**
Net profit per cent. on ordinary capital	**·44**	·96	·42	2·26	**·21**	2·24
One penny variation equals in half year	£1086	£198	£75	£104	£203	£557
Carb. water gas per cent. on total make	**10·11**	..	**4·15**	**8·66**	**6·79**	**1 68**

† These figures show the variation in price in the Companies' principal areas.

IRISH ASSOCIATION OF GAS MANAGERS.

DUBLIN, Aug. 15, 1916.

PRESIDENTIAL ADDRESS

OF

J. E. ENRIGHT, of Tralee.

Gentlemen,—My first duty is to thank you most heartily for the honour you have conferred on me by electing me as your President for the past two years. Unfortunately, these two years have been to us all years of great anxiety and worry, as indeed they have been to millions of our kith and kin throughout the Empire; for during this period a war without parallel in the history of the world has been raging in almost every country in Europe—a war of democracy against militarism, a war for the freedom and liberty of the people, and for the rights of small nations to live in peace and security in their own land. But in this titanic struggle, we all feel and believe that, with the help of Providence, right and justice will ultimately triumph. We must, however, be prepared to meet and grapple with the various exigencies which this cruel war has forced upon us, and, please God, we hope and trust that we shall be able to bear with fortitude and stoicism the many burdens thereby imposed upon us.

A FEW WORDS OF APPRECIATION.

I trust you will pardon me for having so far digressed, for, indeed, I should, before dwelling on this topic, have thanked my colleagues on the Committee for the indulgence extended to me on all occasions during my term of office. Their loyalty should nerve the weakest to action; and I always felt confident of that success which must come from unity and fealty in a body working for the same object with one set purpose and for one common ideal. I also gladly avail myself of this opportunity to express my warmest recognition and hearty appreciation of the splendid work of our capable and painstaking Secretary. He has been to me a guiding star—ever watchful, ever on the alert, where the interests and welfare of our Association were concerned. Personally, I owe him a deep debt of gratitude. Whoever my successor in office may be, I can assure him that, with Mr. Airth as Secretary, the work of the President will indeed be rendered, not only light, but pleasant; and I sincerely express the hope that his invaluable services may long be placed at the disposal of our Association.

LOSSES DURING THE YEAR.

But while we give all the credit that we may to our present-day members, we must not forget those who have been called to their reward, and whose lives and energies were spent in the cause of the industry we have all so much at heart. Since our last general meeting, we have lost one of our best, most active, and most useful members in the person of the late Mr. Stott. By the deaths of Sir Corbet Woodall and Professor Vivian B. Lewes, the gas industry has lost also two of its most distinguished and enterprising supporters. Their places cannot be easily filled; but the example they have set should stimulate each of us to do, in his own sphere, his humble part in the best interest of this important industry.

COAL SUPPLIES.

Rarely, if ever, has the gas industry been confronted with such difficulties as those which the war has brought about; and I offer no apology for making this the main subject of my address to you to-day. New and strange conditions have arisen which differ so much from the past, and vary so much according to local circumstances, that I find it almost impossible to deal with them in a general manner as to their effect on the gas industry at the present time. I feel that many, if not all, of you have experienced difficulties similar to mine in obtaining your coal supplies. I found that many of the obstacles with which I was confronted almost rendered it impossible for me to secure the necessary supply of coals for gas-making purposes. The colliery owners pleaded shortage of output; railway companies, owing to military requirements, were unable to supply waggons for transit to the port of shipment; and shipowners urged that steamers for carrying the coal were not available. While fully appreciating the abnormal conditions prevailing, consequent upon the war, I cannot disguise from myself the fact that some contractors, merchants, and shipowners are availing themselves of their positions as monopolists to make huge profits out of opportunities afforded by the war, at the expense of the nation's requirements. The action of shipowners in charging freights equal to, and in many instances greater than, the increased cost of the coal itself, is not only selfish, but very unpatriotic.

At present, exceptional difficulties and worries in the management of gas undertakings are being experienced on this side of the channel, as the whole of our coal supplies are seaborne; and not only have we to contend with railway difficulties on the other side, but also with the uncertainty of shipment, owing to submarine dangers and enormously inflated shipping freights. Take, for instance, my own case. Before the war, I was purchasing coal delivered to the works at 22s. per ton, made up thus: Coal f.o.b. shipping port, 14s. 6d.; freight to Fenit, 5s. 6d.; lighterage from Fenit to Tralee, 1s. 3d.; cartage into the gas-works, 9d. At the present time, I am charged 22s. per ton f.o.b. shipping port—an increase of 7s. 6d. per ton in the price of coal alone; freights have increased from 5s. 6d. to 22s. per ton, and even at this enormous figure steamers cannot be secured, with the result that I have been compelled to purchase coals of any description available from local merchants, at enormously enhanced prices, in some instances amounting to 57s. per ton.

I should like to emphasize the fact that the "Price of Coal (Limitation) Act" has not afforded any relief to the gas undertakings in Ireland. Colliery people, when remonstrated with, state that the difference in the price charged is due to the increase in railway rates between the pit-head and port of shipment. It is hard to believe that railway rates on the other side of the Channel have increased to such an extent, while on this side they have remained stationary.

While dealing with the question of railway rates, I would like to refer to a case which came before the Courts quite recently in Tralee. The Great Southern and Western Railway Company claimed from my Council a sum as demurrage for the detention of waggons containing coal for the gas-works, which the Company contended were not discharged in time. We wrote to the Railway Company pointing out that the coal arrived on the days of the Tralee races, and that it was impossible to discharge the waggons on those days; also that on the two days following the races the weather was so inclement that carters could not work. We also pleaded the scarcity of horses, owing to the war. The Railway Company were, in these circumstances, requested to forego the claim. This they refused to do, and proceeded to recover before the County Court Judge. We contended that, as a dispute had arisen in the matter, it was a case for arbitration by the Board of Trade, and that the Court had no jurisdiction to deal with it. The County Court Judge held with this contention, and dismissed the claim. On appeal before Lord Justice Ross, the decision of the County Court Judge was upheld, with costs against the Railway Company. This I consider a most important decision, and one which is of vital interest to us all, as it proves that, under exceptional circumstances, such as those mentioned, carrying companies cannot enforce unreasonable terms when dealing with such traffic.

This trouble in obtaining supplies of coal for Irish gas-works engaged our attention at a Committee meeting of the Association held in June last. The members present, realizing the seriousness of the position and the supreme importance of the matter, decided to request the Board of Trade to receive a deputation on the subject; but, I regret to state, no good resulted. The Board refused to accede to our request, notwithstanding the fact that it was pointed out to them that no deputation representative of Irish gas undertakings had appeared before them, and that no other deputation that may have been already received by them had represented us in any way, nor were they fortified with any reliable evidence such as we were prepared to submit for their consideration. A memorandum was received from the Board of Trade dealing with the question, and stating that a Committee had been appointed with a view to facilitate the supply of coal to important consumers and gas undertakings in Ireland who may experience difficulty in obtaining supplies, and suggesting that they might communicate, either directly or through their merchants, with the Committee in whose districts collieries are situated, and from which supplies had been obtained in the past, and who now refuse to continue the supplies. In my opinion, the Board of Trade, in dealing with this important matter in such a trivial manner, were simply shelving the question.

My greatest trouble was not the matter of obtaining supplies from the collieries—serious though this was—but the difficulty, almost the impossibility, of getting steamers to convey the coal to our ports, even at prohibitive freights. I believe, and I think you will agree with me, that in this matter the Board of Trade have displayed a lamentable disregard of their duties and for the wants and requirements of the community. We are undoubtedly faced with a very grave crisis in the gas industry, and one which, if not dealt with in time by the responsible authorities, will inevitably cause disastrous results. If steps are not taken promptly to come to the aid of the gas industry in Ireland, and prevent carrying companies from charging freights out of all proportion to the exigencies of even war times, and to ensure the carrying of coal at freights consistent with fair dealing, many gas-works in Ireland will have to close-down, with consequent loss and inconvenience to a large section of the community. Are the Government to look on and see these merchants grow fat at the expense of struggling gas undertakings? Are they to sit silent while such an industry as ours is being starved to death? Let them wake from their slumbers ere it is too late. Monopoly must be checkmated; and the industry that we represent must receive some protection from utter annihilation.

You have, no doubt, received that now famous circular issued by the Board of Trade asking us to economize by reducing our coal consumption by 10 per cent. It is not my intention to labour this subject, as it has already received a great deal of adverse criticism at meetings of the various Gas Associations and in the Press. However, fortunately for my consumers, I did not need such a futile reminder. Although in Tralee we have suffered from shortage of coal supplies, and on various occasions within the past three months have not had a pound of coal on the works, yet I have not found it necessary to curtail our gas supply in any

way. On the contrary, I have been able to encourage the use of gas for domestic and manufacturing purposes.

CARBURETTED HYDROGEN GAS PLANT.

As far back as June last year I recognized the necessity of taking steps to cut down the consumption of coal at my works, and thereby reduce in some way the enormous increase in the cost of gas manufacture. I went very carefully into the merits of the various vertical retort installations, and found that for my requirements such a plant would cost anything between £5000 and £7000 —an expenditure that could not at the time be undertaken—and even then I would be faced with the coal supply problem.

Following up inquiries which I made about six years ago, I got into communication with Mr. C. B. Tully as to his new gas producing plant. He furnished me with particulars and working results of the plants erected by him and working at Staveley, St. Mary Church (Torquay), and Eckington (near Sheffield), which were of such interest to me that I immediately decided to visit these places and investigate the process for myself. The result of my visits and inspections is better explained by reading extracts from reports submitted by me to my Committee when recommending them to instal one of these plants in our works.

Gas-Works, Tralee, June 29, 1915.

In compliance with your request, I beg to submit for your consideration particulars, &c., with reference to the cost of manufacturing carburetted hydrogen gas as compared with that of coal gas, together with plans, specification, and approximate cost of plant.

Owing to the present serious irregularities and increasing difficulties in obtaining the usual supply of coal, the almost certain increased future cost over the present contract price of coal, dearer freights, &c., I would respectfully suggest to the Committee the desirability of erecting at the earliest opportunity one of those plants as an auxiliary to the coal-gas making plant.

The advantages to be derived may be set out as follows: It can be started to work in a few hours. It would, therefore, be unnecessary to keep retorts under heat idle, as a stand-by in case of emergency. By means of this plant any emergency can be met. Consequently, the coal-gas retorts can be worked to their maximum efficiency. It is simple and inexpensive to work, requiring no skilled labour whatever. The repairs and maintenance expenses are very low, and do not amount to one-fourth of that of a coal-gas plant. The ground occupied is considerably less than that required for a coal-gas plant. The storage or gasholder accommodation is less than that required for coal gas, owing to the ease with which the plant can be started and worked. Moreover, the holders can be kept practically full, thereby assuring maximum presure at all times. The cost of producing carburetted hydrogen gas is considerably less than that of coal gas, as may be observed from the subjoined comparative statement:

Coal Gas.		*Carburetted Hydrogen Gas.*	
Coal, less residuals .	20·72d.	Oil.	3·45d.
Wages, carbonizing .	2·62	Coke	4·60
Purification . . .	0·25	Wages.	1·50
		Purification	0·50
		Steam.	1·16
Cost per 1000 cub. ft.	23·59d.	Cost per 1000 cub. ft.	11·21d.

The above is the present actual cost of coal gas into the holder; but does not include management, rent, rates, &c., which would be similar in both cases. Taken in round figures at 2s. per 1000 cubic feet to manufacture coal gas, it actually costs £3200 to manufacture 32,000,000 cubic feet—our annual make. Providing 50 per cent. of our annual make was produced in the proposed new plant, the manufacturing cost would work out as follows:

16,000,000 cubic feet of coal gas at 2s. per 1000	£1600
16,000,000 cubic feet of carburetted hydrogen gas at 1s. per 1000.	800
Total	£2400

Which shows a direct saving on a year's working alone of £800.

There are other indirect advantages which this plant has as an auxiliary to the retort-house that cannot be expressed in money value. These advantages are unmistakably real, and conduce to a good balance-sheet.

The Committee, after carefully considering the foregoing report, recommended my Council to arrange immediately for the erection of one of these plants, more especially as the existing carbonizing plant was taxed to its utmost capacity, and that, by installing an auxiliary carburetted hydrogen plant, the Council would obviate the necessity of extending and enlarging the present carbonizing plant, which would otherwise have to be done in the near future at a much greater cost than the purchase and erection of the auxiliary plant would entail.

The Council, acting upon this recommendation, ordered from Messrs. Bale and Hardy, of London, a carburetted hydrogen plant capable of producing 100,000 cubic feet of gas per day, under a guarantee that the cost of production should not exceed 1s. per 1000 cubic feet, allowing 20s. per ton for coke (our present selling price) and 6d. per gallon for oil used therein. Notwithstanding the many great difficulties with which the contractors had to contend, the plant was erected and completed in a very satisfactory and workmanlike manner, and was started to work during the month of May last.

The following working results obtained from the plant during the two months that it has been in operation will, I am sure, be of interest to you.

The total amount of gas manufactured for the month of June was 1,886,400 cubic feet, made up as follows:

Coal gas, 915,300 cubic feet	Total, 1,886,400
Carburetted hydrogen, 971,100 cubic feet . .	

The coal carbonized was 84 tons 16 cwt., yielding an average make of gas per ton of coal carbonized of 10,800 cubic feet. The average price of coal per ton was 54s.

The materials used in the manufacture of the carburetted hydrogen gas were:

Coke, 25 tons 16 cwt., at 20s. per ton.	£25 16 0
Tar, 644 gallons, at 2d. per gallon.	5 7 4
Labour	7 10 0
Total cost	£38 13 4

Analyzing the above figures, the cost per 1000 cubic feet of carburetted hydrogen gas manufactured works out as follows:

Coke, 59·51 lbs.	6·38d.
Tar, 0·66 gallon	1·32
Labour	1·85
Total cost into the holder	9·55d.

The coke used includes the fuel for steam-raising, all stand-by charges for coke consumed overnight during week ends, and idle days owing to the gasholders being full.

During the month of July, the total make of gas was 2,016,700 cubic feet, made up of 899,500 cubic feet of coal gas and 1,117,200 cubic feet of carburetted hydrogen gas. The coal carbonized was 82 tons 14 cwt.; and the average price was 55s. per ton. An analysis of these figures shows even a more satisfactory result than that obtained for the previous month. The average quality of the gas is 500 B.Th.U., and the carbonic acid content 3·21 per cent. I am fully confident that with good, clean, hard coke these results can be considerably improved upon. I am at present using very inferior coal of any description that can be obtained, with the resultant bad, soft, and dirty coke. The working of the plant is extremely simple and easy, and is done by a youth of 18 years of age, who has sole charge of it, and whose duty it is to make sufficient carburetted hydrogen gas to mix with the coal gas so as to keep the holders always full.

I consider a plant such as I have installed at Tralee is of the greatest comfort to the manager, and saves him an endless amount of trouble and anxiety; for, as already stated, I was on several occasions completely out of coal, and had to rely on the carburetted hydrogen plant exclusively. The plant is so flexible that you cannot fall short. For instance, I am using tar instead of oil for enrichment. For fuel, instead of coke, anthracite coal, house coal, cannel, or any kind of non-caking coal can be used. My own idea regarding the future working of the plant is to use some good coking cannel—such as Bent, Clydesdale, Quarter, or Allanton, which, in addition to yielding a very rich gas, makes a good hard and intensely hot coke that should answer very well in the generator.

I must apologize for occupying so much time with this subject; but it is, in my opinion, one of very great importance, and at the present time worthy of our best consideration. Sea-borne coal will never again be as cheap as heretofore. Higher wages and dearer freights will all tend to keep up the price of this commodity. Consequently, the outlook for small gas-works in Ireland, making anything between 3 and 5 million cubic feet of gas per annum, is very black indeed. But I am convinced that a plant such as I have referred to, on a smaller scale, using cannel coal as a fuel, and making about 40,000 cubic feet of (say) 450 to 500 B.Th.U. gas per ton of coal, would be a means of not only saving these works from bankruptcy, but of converting them into really profitable undertakings.

The days of the old direct-fired single, double, or treble retorts are over. Something must be done in the way of economy by these small undertakings, and that pretty quickly, or they will otherwise become, ere very long, a thing of the past. I have been tempted to express my views rather strongly, knowing as I do that the majority of the gas-works in Ireland are very small. I am of opinion that in future the demand will not be for an illuminating gas of a very high grade, but rather for a cheap, clean gas of 450 to 500 B.Th.U., which will be more useful for manufacturing and domestic purposes.

RESIDUAL PRODUCTS, ETC.

Generally speaking, the markets for residuals have been very unsatisfactory. The production of sulphate of ammonia has been almost impossible, owing to the scarcity of sulphuric acid required for the purpose. The market for coke has, however, been very good; and in all probability the demand for, and commercial value of, this article will be greater after the war than heretofore, owing to various purposes for which it can be utilized.

Notwithstanding the requirements of the Government for toluol and benzol, tar has been selling at a very low price, and is likely to remain a drug on the market in this country until such time as local authorities adopt more extensively the improved system of steam-rolling and tar-painting the roads in their districts, which the Road Board ought to aid and encourage by making grants from funds at their disposal for this useful public purpose.

I think we may, however, look forward with hope for a great and prosperous future for the gas industry after the termination of this devastating war, which I sincerely trust will be speedily and successfully concluded in our favour.

BYE-PRODUCT GAS-OVEN DESIGNED FOR TOWN SUPPLY.

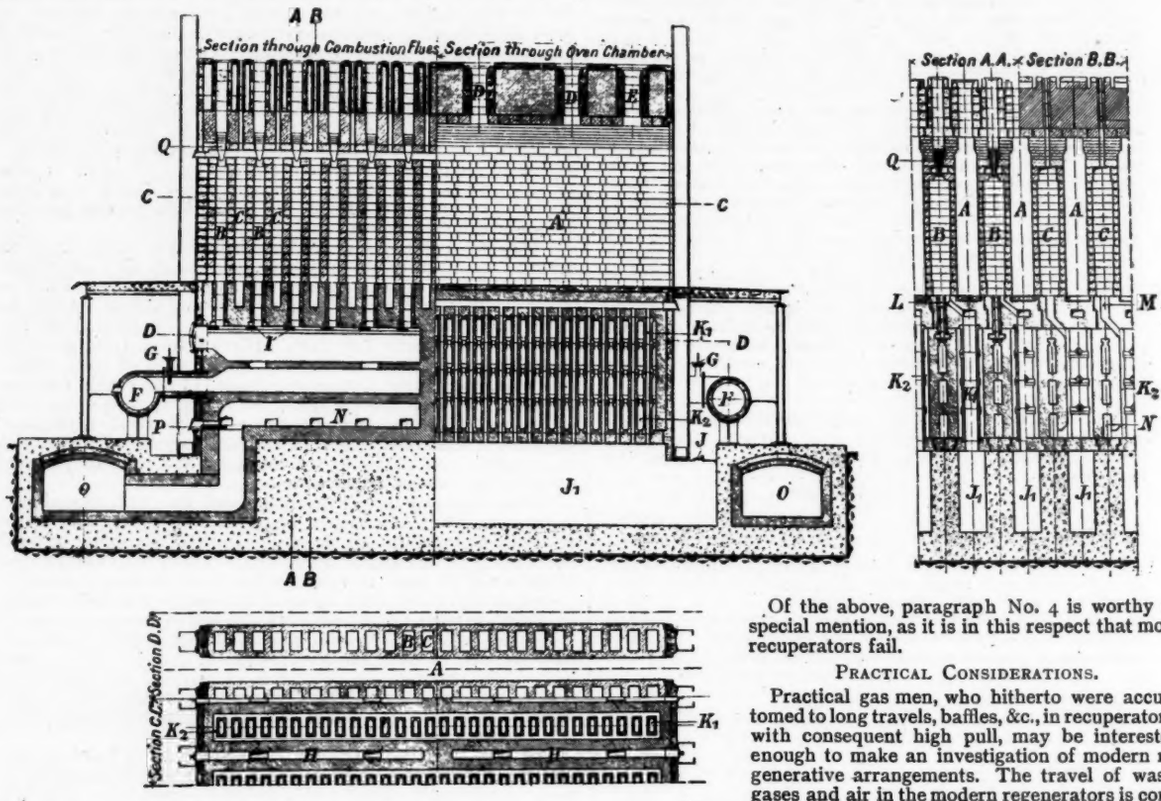
NEW TYPE OF RECUPERATIVE GAS-OVEN DESIGNED TO RECOVER ALL THE GAS.

A NEW design of bye-product gas-oven, intended for town gas supply, is described by Mr. William Feicks, the Chief Engineer of the Coal Tar Engineering Corporation of New York City, in the following article contributed to the "Gas Age."

The opinion commonly prevailing among gas men that it is not possible to produce a high-grade coal gas, both in regard to calorific and candle power, in coke and gas ovens, is undergoing radical changes. While this was true of the older-type coke-ovens, poorly designed and constructed in regard to tightness and other important principles of gas manufacture, and using a cheap grade of coal, the many modern installations now in operation abroad and in this country have well established the fact that in no other gas manufacturing system can better results be obtained from a given coal. The distinct advantages of the bye-product retort gas-oven—such as the superior quality of coke and tar produced, and, not the least, the exceedingly low first cost as compared with other coal-gas retorts now on the market—are gradually conquering for it the place which it deserves in the gas industry.

Gas men—who are primarily concerned with the manufacture of gas, the coke being of secondary consideration—are more particularly interested in retort-ovens heated with producer gas; the principal features of the present recuperative arrangement may be summed up as follows:

1.—The transfer of heat from the hot waste gases to the air is effected strictly in accordance with the "opposed" or "counter-current" principle.
2.—Largest heating surface per unit weight of tile and ton of coal carbonized.
3.—Exceedingly small number of joints and "bed-joints" only, with the weight of tile resting on them.
4.—Arrangement of heating flues and recuperators is such as to produce the least possible difference in pressure on both sides of the recuperator tile.
5.—Accessibility of recuperator flues for inspection and making repairs.
6.—Individual recuperator flues may be shut off should they become defective.
7.—The recuperator is of exceeding simple design and durable construction.



disposal of the large quantities of coke incident to straight bye-product coke-oven practice representing in many cases a serious obstacle. There are now on the market many types of bye-product retort gas-ovens using producer gas as a fuel; but to most gas men these types represent a rather abrupt departure from the present coal-gas bench practice; and it is hard to get them to take the step.

There is here described a new type of bye-product retort gas-oven which should be of special interest to gas men, because it is designed more in accordance with present-day practice; and in this respect special mention is made of the recuperative system employed.

RECUPERATIVE OVENS.

While it is true that coke or gas ovens employing recuperators have been built, they have, generally speaking, not been as successful as regenerative ovens in regard to fuel economy; and for this reason the regenerative system to-day is more commonly used in large chamber ovens. It has been the writer's experience that the above results cannot be conclusive, since such comparisons have mostly been made between poorly-designed recuperative and well-designed regenerative ovens.

The oven here presented employs recuperators which are protected under a United States patent; and it is expected that they will be equal in efficiency to regenerators, while not possessing any of the mechanical complications of regenerative ovens. The Of the above, paragraph No. 4 is worthy of special mention, as it is in this respect that most recuperators fail.

PRACTICAL CONSIDERATIONS.

Practical gas men, who hitherto were accustomed to long travels, baffles, &c., in recuperators, with consequent high pull, may be interested enough to make an investigation of modern regenerative arrangements. The travel of waste gases and air in the modern regenerators is comparatively short and vertical, and velocities low; and the best method of laying the checker-brick now is to form straight flues, thus avoiding all unnecessary resistance. With temperatures such as exist in recuperators and regenerators, there is little danger of cold cores, as in low-temperature work, where baffling increases the efficiency. An explanation of this may be found in a comparison between the so-called dead-air space when used for high and low temperature.

While practice has shown that long travel and baffling do not increase regenerator efficiency, it has the serious drawback for recuperators of high pull and its increased danger of air leakage.

PRODUCER GAS FIRING.

The producer question in the present oven has been decided in favour of outside producers. They are arranged on either or both ends of the stack of ovens, and preferably separated from the oven brickwork. The coke-fired producers are enclosed in a steel shell, to ensure tightness, and equipped with all modern appliances, to ensure a proper working with a minimum of labour and care.

The carbonic oxide from the producers feeds into a common brick-lined main; a dry dust-catcher being interposed in this line to remove a large percentage of the dust carried over from the producer. From the collecting main the carbonic oxide is distributed at either side of the ovens by the carbonic oxide mains F. The carbonic oxide admitted to each half of the oven-wall is regulated by dampers G, while the relative quantities of carbonic

oxide admitted to each heating flue B can be regulated by setting the clay dampers I, which are accessible through doors at the front and back of the ovens.

PRACTICAL OPERATION.

The air for combustion enters the foundation galleries J1, and from here distributes through the recuperator tubes K1, where it becomes highly heated by the waste gases surrounding these tubes. The heated air flows through ports L into the heating flues B, where it mixes with the carbonic oxide. The relative quantities of air admitted to the flues B can be regulated by raising or lowering the clay plugs Q, the lower tapered ends of which control the circular outlets of the heating flues. Adjustment of the plugs is effected by first removing them with a short rod, after which the number of fireclay rings or washers placed under their upper supporting collars is changed to suit, and the plugs are put back into place. To permit inspection of the heating flues without disturbing the plugs, an inspection-hole is provided through their centre.

The regulation of the carbonic oxide and air supply to the heating flues can be so adjusted that alternate flues B receive a slight excess of carbonic oxide and secondary air respectively, which, on mixing in the downtakes C, cause additional combustion. Generally speaking, however, it is good practice not to overheat the upper oven space, in which the distillation gas collects, to save valuable bye-products.

The advantage over similar arrangements of this method of regulating the air supply to each heating flue is that the regulating bodies are supported on such parts of the brickwork where the heat is less intense, as they are not bodily inserted into the heating chambers, and there is no possibility of freezing to the oven brickwork, and thus becoming inoperable. This arrangement of individual air control for the heating flues is protected under United States patent.

ARRANGEMENT OF FLUES.

The heating flues themselves are of the well-known vertical type, and consist of alternate up-and-down takes B and C respectively for the heating gases. The waste gases leaving flues C flow through the ports M into the recuperator chambers K2, and down the latter into collecting flues N, and finally into the main flues O. In the recuperator chambers, the temperature of the waste gases is reduced to about 1100° Fahr. by the air flowing through the tubes K1, as already referred to. There is a main waste gas damper P for each half of the oven wall.

The waste gases leaving through the main flues O are passed through waste heat boilers for the generation of steam before they are discharged into the stack.

INSPECTION AND MATERIAL.

The oven or retort chambers A are provided with tight-closing doors at each end, while in the top there are the usual openings for charging the coal D and connecting the gas off-take pipe E. All inspection-holes, charging-holes, &c., are provided with covers of satisfactory construction.

Very careful attention has been given to the selection of the refractory material and the proper arrangement of the expansion joints. The oven-walls from the oven floor up are built of star silica, with a special clay facing at either end to protect it against the inclemency of the weather. The supporting walls and the recuperators are built of the highest grade clay; while a second-grade clay is used for the oven-top, waste-gas flues, &c.

Gas Contracts in France.

It is announced in the "Journal des Usines à Gaz" that a revised price for gas has been adopted in a further seventeen towns, as the result of the decision of the Conseil d'Etat in the Bordeaux case. The list includes the towns of Biarritz, Bourg, Carentan, Courville, Dives, Etampes, Granville, Isle-Jourdain, La Ciotat, Libourne, Livarot, Luçon, Parthenay, Rochelle, Saintes, and Vimontiers. The newly accepted prices range from 35 c. to 60 c. per cubic metre [7s. to 13s. 6d. per 1000 cubic feet]; the advances varying from 10 c. to 20 c. In a number of other towns, where previously 35 c. was charged, the price is now 60 c. In one case —that of Brie-Comte-Robert (Seine-et-Marne)—the consumers paid 80 c. [18s. per 1000 cubic feet]; but even at this price working has had to be discontinued. In other towns, the price to be charged is under discussion.

Supply of Gas in Italy.—The Italian Government have, it was last week stated by the Rome Correspondent of "The Times," appointed a Commission to deal with the question of the price of gas. He adds: The "Tribuna" says that the gas companies have declared that they cannot carry out existing contracts, and must either close-down or raise the price to cover the cost of production. The Commission will examine the whole question, and fix the price. The price of gas has already risen all over Italy. At Milan, for instance, it has more than doubled. Rome, so far, has been more fortunate; and the increase has been slight. But it is clear that the price will go up as a result of the Commission's investigations. In the country, where, as far as the towns are concerned, gas has become the chief fuel for cooking, the increase in price is serious. Fortunately, the companies have been able to recoup themselves to some extent for the fantastic price of coal by a great increase in receipts from bye-products.

THERMAL PROBLEMS FOR GAS ENGINEERS.

V.

By NORTON H. HUMPHRYS, Assoc.M.Inst.C.E., F.C.S.

Equilibrium of Heat.

ALL applications of heat for practical purposes, whether positive or negative (generally described as "heating" or "cooling"), depend on the fact that heat invariably tends to the establishment of an equal temperature or equilibrium, by a sort of levelling-up process between relatively hot or cold bodies, until the whole system has attained the same temperature. If we take a number of small cubes of iron, of equal size and weight, but at various temperatures, and place them together in a box made of non-conducting material (into which they exactly fit) furnished with a gas-tight lid, so as to avoid all external loss of heat, they all acquire an even temperature that is an arithmetical mean of the whole. Four cubes at 40°, 70°, 80°, and 100° respectively, acquire an equal temperature of $\frac{40 + 70 + 80 + 100}{4} = 72\frac{1}{2}°$.

If, however, the cubes, while in all other respects as before, are of different materials and have different specific heats—say, 0·2, 0·4, 0·6, 0·8 respectively—the equilibrium will not be established at the arithmetical mean, but will adjust itself according to the several specific heats. They will acquire an equal temperature of 82°.

(1) at 40°, gains	42°,	— 42 × 0·2 =	8·4 B.Th.U.
(2) ,, 70°, ,,	12°,	— 12 × 0·4 =	4·8 ,,
(3) ,, 80°, ,,	2°,	— 2 × 0·6 =	1·2 ,,
Total gain			14·4 ,,
(4) ,, 100°, loses	18°,	— 18 × 0·8 =	14·4 ,,

No. 4 block at 100°, loses 14·4, which is distributed as just described.

Again, suppose that a sphere of chemically pure lead (weight 4 lbs.) is heated throughout its substance to a temperature of 100°, and introduced carefully, to avoid splashing, into a vessel containing an equal weight of water, with precautions against external loss of heat as before. The lead becomes cooler, and the water gains heat, until an even temperature of approximately 61·22° is attained. The specific heat of lead being 0·0314 [see Table VI.], and water, 1·0, the lead loses 100 − 61·22 = 38·78°. 38·78 × 0·0314 = 1·218 B.Th.U. The water gains 61·22 − 60 = 1·22. 1·22 × 1·0 = 1·22 B.Th.U.

Now assume that the box (still in other respects as before) is in size equal to a 4-feet cube, and that the four blocks are severally placed near the four corners, and therefore some 4 feet clear away from each other. It is also understood that the box is otherwise empty and exhausted of air, and that the blocks are introduced without disturbing the condition. Conduction by contact cannot obtain; but the equal temperature is again attained, as the heat passes across the intervening spaces by radiation, and the time occupied in securing the result is proportional to the relative radiating power of the cubes.

If the box, otherwise as before, is freely exposed to the air, and when the cubes have been introduced and the lid closed, the intervening space is occupied by air, and that the same is at a temperature of 60°, the equilization of temperature throughout will be arrived at in much less time, because, in addition to transmission of heat by radiation as before, there is the effect of convection or air-contact. A fifth substance having been introduced, the mean will be that of the five, adjusted according to their respective specific heats as before.

There is an important difference between gases and the other forms of matter in regard to the transfer of heat. A solid or liquid alters slightly in total volume, and expands or contracts, as the case may be, equally in all directions, provided it is free to do so. But the transmission of heat to or from gases causes them to become lighter or heavier, and therefore to rise or fall. The result is a fairly brisk movement or current, towards and away from the source of heat. Fresh surfaces of air are continually being presented. An object freely exposed to the atmosphere quickly acquires the mean temperature, and the action is accelerated if convection is assisted by wind or other sources of motion. If we wish to thaw a block of ice, or to cool a liquid or a solid, in the shortest possible time, we place it in the open, and not in a confined space.

We have next to consider the conditions obtaining in an ordinary building or apartment, in which the atmosphere and solid objects are maintained by artificial heat at a temperature of 60°, against a mean outside temperature of 40°. There will, under such circumstances, be a continual loss of heat, caused by the tendency to equilibrium as between the interior and exterior temperatures, and the rate of loss will depend upon the absorbing, conducting, and radiating power of the walls and ceiling. In a structure of corrugated iron, the loss will be greater and more rapid than if the walls are constructed of brick or stone, and the roof is enclosed in the usual manner. The interior surfaces, being exposed to the source of heat and to the influence of convection, will tend to acquire the mean interior temperature. In the same way, the exterior surfaces will tend towards the mean outside temperature. The surfaces respectively will be something below and something above the mean temperatures, and the differences

will vary with the heat-conducting power of the walls. If they are thick, and of poor or non-conducting material, the differences will be small, but under contrary circumstances, they may approach closely to the mean between the two temperatures. If the inside temperature is to be maintained, there must be a continual supply of heat sufficient to counterbalance the loss.

The transmission of heat as above illustrated, and with or without the medium of a solid surface, covers nearly all the problems concerned in the practical applications of heat. Obviously, the simpler and more direct the method of transmission selected, the greater the degree of efficiency and the economic result. If possible, the source of heat is brought into direct contact with the objects to be heated, as in a lime or pottery kiln; but a containing vessel, such as a boiler, a crucible, or retort, is a practical necessity in other instances. The heat generated in a furnace passes through the walls of the containing vessel to the contents, and is imparted to them in the manner already illustrated. Hot gases, or liquids, flowing through freely exposed or artificially cooled tubes, lose their heat by convection to the interior surface, conduction through the body of the tube, and radiation or convection on the exterior surface.

The effect of distance, as causing loss of radiated heat, is so slight, that for all practical purposes it is regarded as *nil*. The heat must pass through several miles of air or other medium before evidence of any loss is obtainable. There is a considerable difference in absorbing and radiating power, as between various substances; but it appears to be as much a matter of the physical condition of the surface as of characteristics peculiar to any individual element. Polished and smooth surfaces are weaker than dull or rough ones. Polished sheet iron being taken as = 1, the radiating and absorbing power of the same sheet, after it has been allowed to become evenly coated with rust, is more than 7, and is little less than that of ordinary building materials per unit of surface. According to experiments, the colour of the surface has little or no effect; but the usual custom of wearing white or light coloured hats or clothing in summer weather would appear to suggest the contrary. No one would believe that the rate of absorbtion of radiated heat from the sun was the same with a black or white hat made of the same material. The amount of radiation is entirely a matter of surface area, irrespective of the form or shape, or whether the body is solid or hollow. A cube, sphere, cylinder, polygon, of the same surface area as measured in cubic feet, or any other convenient standard, would radiate the same amount of heat; but with a star or other shape having re-entrant angles, free radiation may be obstructed. Tubes or other hollow bodies, through which a current of liquid or gas is passed, for the purpose of being heated or cooled, show some variation in practical effect, due to the fact that the proportion between the surface and the interior cubic content varies according to the diameter and the thickness of the tube. The surface, as compared with the diameter, varies in direct arithmetical ratio; but the content is in proportion to the square of the diameter, or in geometrical ratio. A tube of 2 inches diameter will have half the surface possessed by one of 4 inches diameter, but only one-fourth of the content; and the same applies to a cube or a rectangular section. The smaller the diameter, the greater the practical efficiency of the tube, provided that free radiation and convection obtain, which may not be possible, with a cluster comprising a large number of small tubes.

The relative conducting power of materials varies through a wide range, from 1 to over 2000, and is influenced by individual peculiarities to a greater extent than the other forms of heat transmission. Pure metals are by far the best conductors; but the power of copper is twice that of iron, and five times that of lead. It is more than a hundred times that of ordinary brickwork per unit of cubic content. Finely-powdered brick has about one-fourth of the conductive power possessed by the solid, and the best non-conducting materials are those possessing a porous, fibrous, or otherwise finely-divided structure of organic or non-metallic origin—such as wool, hay, cork, &c.

In practice, it usually happens that the selection of material must be governed by factors other than heat efficiencies; and sometimes there is little or no choice. These are durability and freedom from an objectionable degree of expansion or contraction under the variations of temperature to which they may be exposed, resistance to chemical action, such as oxidation or corrosion, first cost of material and of manipulating the same, &c. On these accounts, fireclay is all-round the most suitable material for retorts and furnaces, notwithstanding its low radiating and conducting qualities, and wrought iron is preferred to copper for large steam generators or coolers.

"Gross" and "Net" Calorific Values.

A complication of an artificial character has been created by the fact that, at ordinary temperatures, the product of combustion of hydrogen, either in the free or in the combined state, is in the form of a liquid, and is obtained as such in the ordinary calorimeter tests, in which the products of combustion are cooled to atmospheric temperature. The temperature or latent heat of liquification, which we have seen is 996 B.Th.U. per lb. of water so condensed, goes to the credit of the hydrogen. One pound of hydrogen forms on combustion 9 lbs. of water; so the heat due to this source is $966 \times 9 = 8694$ B.Th.U., or more than 14 per cent. of the total. For some practical purposes—such as the use of a condensing "radiator" heating stove or a contact geyser—the whole of the heat can be practically utilized; but in others, such as boiling water, this is not possible. The net value as usually expressed is based on the assumption that the water vapour escapes as such, and the heat of liquification is left out of the calculation. Not only is the latent heat deducted, but also the visible heat of reduction to atmospheric temperature—about 150 B.Th.U. giving a total of 1116 B.Th.U. This quantity, deducted from the gross value, leaves the "net," as usually understood; and as the proportion of hydrogen present in ordinary town gas is about 50 per cent. (by weight), it brings the "net" as about 10 per cent. less than the gross calorific value.

The position is anomalous in more than one respect. If water vapour is considered to leave the calorimeter at 212°, the same applies to the other products of combustion, the carbonic acid, and the accompanying nitrogen. The heat so represented would not amount to more than a few units per cent. The proper way of arriving at the "net" would be to so arrange the calorimeter that the products escaped at 212°. But if the value of the gas is so obtained, the user of the condensing radiator will get 10 per cent. more than the official value. A substance can no more have two different calorific values than two specific gravities or specific heats. And directly we take into consideration the different results, as between the laboratory and practical use, we close the door to anything definite. It might be urged that the "net" value was practically unobtainable in everyday use, and that further reductions should be allowed. Attempts to reconcile both the laboratory and the everyday user have always been the difficulty in the way of arriving at a photometrical standard that would satisfy all parties concerned. The position presents some similarity to that of "dry" and "saturated" gases.

All calorific values mentioned in these articles are stated in "gross" terms.

(To be continued.)

Droitwich Gas Undertaking.

The first annual report of Mr. Reginald Thomas, the Gas Manager, to the Droitwich Corporation Lighting Committee, states that the quantity of gas manufactured in the year ended March 31 last (29,042,200 cubic feet) shows an increase of 1,562,200 feet, or 5·03 per cent., over the preceding twelve months. The amount of coal carbonized was 2436 tons, as against 2486 tons, a decrease of 50 tons; the yield of gas per ton having risen from 11,053 to 11,900 cubic feet—an increase of 847 feet per ton. The gas sold and accounted for per ton was 11,132 cubic feet, which was 482 feet more than the year before; the amount unaccounted for having gone up from 3 6 to 4·8 per cent. The gross profit, after allowing for depreciation, is £1071; and when principal and interest charges, and £531 for additions to plant, are deducted, there remains a credit balance of £50. The cost of coal increased 3s. 1d. per ton; and there was an all-round increase in wages which added to the item for labour. Spent oxide realized a considerable sum; oxide that was bought three years ago at 23s. per ton having been sold for £2 12s. 6d. per ton. Some 35 tons was released for sale, owing to the adoption of the "backward rotation" system of purification. The number of consumers—347 ordinary and 430 prepayment—remains practically the same as a year ago.

Aldershot Gas, Water, and Electricity Supply.

In his address to the proprietors at the half-yearly meeting of the Aldershot Gas, Water, and District Lighting Company, the Chairman (Mr. W. T. Robertson, J.P.) stated that the high price of coal, coke, and oil had been balanced by the extra revenue from residuals. They were doing their very utmost to assist the Minister of Munitions in the production of explosives; and the General Manager (Mr. R. W. Edwards) was at present engaged in putting down further plant to increase supplies in this respect, and with a view to assisting, in a modest way, to bring the war to a successful conclusion. Their water and electricity departments were progressing satisfactorily. The War Department knew by this time that the Company could be depended upon to carry out big things successfully, without failure or disappointment; and full advantage had from time to time been taken of their magnificent water supply. The future might be clouded in mist; but whatever happened, they intended to work diligently to keep the flag flying and to maintain the affairs of the Company in as prosperous a condition as possible. Speaking on the report [to be found in the "Journal" for the 25th ult., p. 183], Mr. A. F. Wilson, as the oldest Director of the Company, said he desired to associate himself with the proposal for its adoption. In his opinion, the Company owed a very great debt to their Directors and officials. Although he had now been away from the management for some years, he had not failed to note that the business of the Company had steadily increased; and he was quite assured that the men at the head of affairs were acting for the best, alike for the public and themselves. This he was able to say as one who had been associated for a great number of years with the Company. Mr. Edwards, responding to a vote of thanks, referred to the anxious times which they had been passing through during the past two years, and to the loss of many of the members of his staff; but he added that those who had left had got the military fever, and realized the patriotism of the work in which they were engaged. Fortunately for the country, but perhaps unfortunately for himself, his staff had been re-organized three times since the war; but he was glad to be able to say that the bed rock remained, even if it was not quite the same. Undoubtedly gas undertakings had a very big future; but they had to yet learn many new lessons, as well as to unlearn a good deal of what they had already learned in the past. One of the net results of the war would be that they would be able to make many developments, and to place many new things before the public.

CORRESPONDENCE.

[We are not responsible for opinions expressed by Correspondents.]

Poor Gas and Kettle Boiling.

SIR,—The view has recently been seriously put forward that, from the consumer's point of view, it is immaterial whether he be supplied with gas of 550 B.Th.U. or 500 B.Th.U. to boil his kettle. There is certainly no justification in theory for such a view; and the tables I give below show that it is not borne out in practice.

Summary of Results of Different Gas Samples when Used for Boiling a Kettle of Water.

No. 1 SET.

One Quart of Water Raised from 58° to 212° by a Boiling Ring Turned up to an Average Size of Flame.

Illuminating Power. Candles.	Calorific Power. B.Th.U. Gross.	Consumption of Gas. Cubic Feet.	Rate per Hour. Cubic Feet.	Time Occupied. Min. Sec.	B.Th.U. Required in Experiment.
6·48	471·1	1·96	30·0	4 7	923
14·32	554·0	1·60	22·5	4 25	886
19·07	641·7	1·42	21·1	4 22	911
No. 2 SET. (CONDITIONS AS BEFORE.)					
8·88	499·7	1·77	23·4	4 32	884
14·59	549·0	1·57	19·5	4 49	861
18·71	683·5	1·33	15·6	5 6	909
No. 3 SET.					
One Quart of Water Raised from 58° to 212° by a Boiling Ring Supplied at a Fixed Rate.					
8·88	499·7	1·71	18·0	5 34	854
14·40	549·2	1·515	18·0	5 3	832
18·71	683·5	1·35	18·0	4 30	922

The fact of the matter is, the kettle of water is a rough-and-ready calorimeter; and if poor gas is supplied to the consumer instead of "straight" gas, he will have at least to burn proportionately more of it. Should not this fact be borne in mind when his account is made up?

CHARLES CARPENTER.

South Metropolitan Gas Company, Aug. 9, 1916.

Standardization of Tests.

SIR,—Now that the illuminating power standard of gas is to be largely discontinued, and the standard placed on the more reliable calorific basis, it is about time that a recognized standard of testing for gas-heating apparatus of all sorts was introduced.

If one or more of the numerous societies and boards of the gas industry arranged together (say) with the Leeds University, a recognized standard could easily be arrived at, and there could be no question of collusion or influence from the manufacturers of such apparatus, who should, however, be obliged to comply with the rules, and no other tests should be recognized.

A plain, straightforward, all-round test of all apparatus should be easily arrived at, and the simpler the better—provided it shows in which way the heat is utilized, and at the same time shows up the best features and the weakest points of the apparatus under test.

Very minute details should be studiously avoided, as they only confuse and unnecessarily complicate the main points at issue. There is little purpose served, from a selling point of view, by tracing out the last fraction of the last unit available for domestic or commercial heating; and, after all, coal gas is not as precious as gold, radium, or even electricity at the present time. Water heating is already provided for with its recognized unit for basis; and there is little opportunity to "cook" tests here without deliberate recourse to untruthfulness. With gas fires and cookers, however, the case is different; and the field for unreliable comparative tests is enormous.

If a standard could be arrived at, and kept to, there would be a tendency in the trade to stimulate a healthy competition, encourage real advancement, and avoid all possibility of pushing doubtful improvements or useless ideas by means of cleverly-worded and imaginative advertisements.

For instance, the radiant efficiency of gas-fires could be tested by Professor Boys' radiometer or other approved type of apparatus. Electrical testing by itself is unreliable, as it is affected by its surroundings and climatic conditions, which, however, cannot affect the water test.

Ovens could be tested comparatively according to their type, whether externally or internally heated, jacketed or otherwise, and cast or wrought iron. Their heating surface (not cubical capacity) should be, for obvious reasons, the basis for comparison. The temperature and volume of the products from the flue outlet will show any loss through imperfect construction or bad fitting, &c.

The idea might be carried still further by appointing an unbiassed testing committee, with an unbiassed staff of disinterested (so far as the trade is concerned) technical experts to test all apparatus sent to it. Certificates could then be issued for economy, efficiency, and hygienic qualities—the percentage marks being allowed to be used as an advertising medium for the manufacturers. Part of the cost could be covered by a fee for each apparatus tested, which no doubt most manufacturers would be willing to pay. The gas profession would doubtless be willing to support such a scheme, to enable them to supply their consumers with the best of everything. The scheme could be made an absolute success if gas engineers refused to purchase any apparatus that did not possess such a certificate, and also to deal with manufacturers who refuse to comply with such recognized standard tests.

This is merely a brief outline, and details very much depend on whether manufacturers are to be left to give their own tests or whether it will be done for them, all under absolutely the same conditions, with the same instruments, and by the same staff.

THOS. W. FLETCHER, Chairman,
FLETCHER, RUSSELL, AND CO., LIMITED.

Warrington, Aug. 9, 1916.

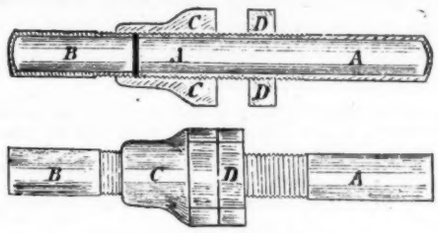
REGISTER OF PATENTS.

Pipe Joints.

HATT, L. R., of Grays, Essex.

No. 10,156; July 12, 1915.

This is an improved connector for high-pressure pipes—consisting of a socket, piece of piping, and a back nut. The end of the socket is made to the same dimensions as the back nut, and flat to engage with the flat surface of the back nut. Leakage, caused by the uneven expansion and contraction of the socket and the back nut of the connector as now in use, is prevented by the end of the socket being made to the same dimensions as the back nut.



Hatt's High-Pressure Gas-Pipe Joint.

A longitudinal section, and an outside elevation of the proposed connection is given. A is the pipe intended to be connected up to the pipe B, or *vice versâ*. The pipe A is screwed on the outside over a considerable length from its end; while the pipe B is also screwed on the outside, but for a much shorter length. C is the socket, which is formed cylindrical over the smaller end and hexagonal over the larger end. D is an ordinary hexagonal back nut which is screwed up to the socket C as shown in the exterior view. To make this connection, the socket C is screwed on to the pipe B and then the back nut D is screwed up to meet the socket.

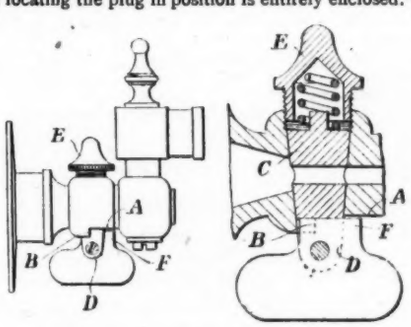
Valves and Cocks.

DERHAM, G. H., of Small Heath, Birmingham.

No. 10,802; July 26, 1915.

This invention comprises means for locating the valve in the closed position.

The body of the valve is provided with an opening at its lower end through which the end of the plug projects. The opening is substantially D-shaped, and a projecting tongue on one side of the end of the plug spindle is so positioned that, when it abuts against the flat upright side of the D-shaped opening, the plug will be in the off or closed position. The projecting end of the plug spindle is squared to receive a washer clamped in position by a nut engaging over the screw-threaded end of the plug spindle—the washer preferably conforming exactly to the exterior shape of the valve body, and thus providing a "clean, smooth exterior without any corners or recesses, and at the same time the stop for locating the plug in position is entirely enclosed."



Derham's Gas-Fitting Valve or Cock.

In the modification (shown), intended more especially to be applied to small valves for gas lights and other purposes, the body has a D-shaped portion, cut away at A so as to leave upstanding projections B. The plug C is placed in the body with its small end D projecting—being held in position by means of a spring pressed upon its upper end by the cap E. The small end of the plug is slotted, and a tap or finger-piece is secured in the slot by means of a screw. A projection F on one side of the finger-piece serves to engage against either of the abutments B, so as to locate the plug in one or other of the closed positions.

Gas Cooking Stoves or Ovens.

CLARKE, W. C., of Bournemouth.

No. 17,984; Dec 24, 1915.

This gas cooking-stove is of the type which comprises an outer oven provided with heat inlet and outlet and an inner oven within the outer oven, but separated from it, to form flues for the passage of heat and products of combustion; the outer oven being formed of cast or sheet metal plates with a liner of non-conducting material between the side and back plates. The inner oven is formed by the bottom plate of the outer oven and by side plates which extend from the front plate of the outer oven to the back plate, and by a crown plate connecting the side plates. The crown and side plates are at a distance from the sides and the top or hot-plate of the oven, thus forming side and top flues; and, to prevent the escape of heat from the flues on the oven being opened, only one door is provided, carried by the front plate of the outer oven or casing.

The chief feature of the invention consists in arranging the gas-burners in openings at the bottom of the side flues and not, as hitherto, in a combustion chamber under the bottom plate of the oven; also in the provision of kettle and saucepan openings in the top or hot plate of the outer oven and above the side flues, which are clear, and not, as heretofore, divided into channels; and, further, the grilling chamber and grill therein are located beneath the bottom plate of the oven.

Heating and Ventilating Apparatus.—No. 100,864.

WALTERS, B. H., of Southfields, S.W., and CREASEY, H. H., of Winchmore Hill, N.

No. 7296; May 22, 1916.

This invention relates to heating and ventilating apparatus of the kind described in patent No. 11,802 of 1915, and in which air is admitted through inlet openings into an upper chamber, is heated therein, and discharged through an outlet duct—the chamber being heated by a gas-burner disposed below it and within a lower combustion chamber, which chambers are separated by an intermediate partition or plate.

The apparatus is particularly designed "for use for the heating, ventilation, and better preservation of church and other pipe organs, and the like large musical instruments." An illustrated description of the arrangement appeared in the "JOURNAL" for June 27 last, p. 685.

Baker's Ovens.—No. 100,865.

BAKER, G. S., of Willesden Junction, N.W., and KEITH, J. & G., of Farringdon Avenue, E.C.

No. 7715; July 23, 1915.

This invention relates to baker's ovens of the class known as the "travelling" type, wherein there is used a movable sole, or a series of endless chains adapted to support a wire or network sole, or trays, pans, or other receptacles to receive the goods to be baked—the sole or chains and the receptacles supported by the latter conveying the goods throughout the length of the baking chamber.

The object of the invention is to provide doors or equivalents in the bottom of the oven to give access to the interior of the baking chamber for the removal of obstructions which may occur to the passage of the sole or chains through them, or for other desired purpose.

The arrangement was fully described and illustrated in "JOURNAL" for Nov. 23 last, p. 426.

APPLICATIONS FOR PATENTS.

[Extracted from the "Official Journal" for Aug. 9.]

Nos. 10,755—11,096.

ANDERSON, W.—"Production of toluol, benzol, and other light hydrocarbons from heavy oils." No. 11,033.

ANDERSON, W.—"Carbonization of coal, &c." No. 11,034.

BRITISH THOMSON-HOUSTON COMPANY—"Governing mechanism for compressors and exhausters." No. 10,906.

CAPRON, F.—"Manufacture of ammonium sulphate." No. 10,864.

DAYTON, W. C.—"Making gas from liquid hydrocarbons." No. 10,889.

General Electric Company—See British Thomson-Houston Company. No. 10,906.

HIRD, H. P.—"Process for extracting tar acids or phenols from coal tar or like oils." No. 10,885.

HOLT, G. W.—"Cowl for geysers." No. 11,051.

MEIKLE, J.—See Anderson. No. 11,033 and No. 11,034.

MITCHELL, J.—"Coin-counters for prepayment gas-meters." No. 11,044.

PARKINSON AND W. & B. COWAN—"Wet, &c., gas-meters." No. 10,792.

PARKINSON AND W. & B. COWAN—See Mitchell. No. 11,044.

THOMAS, A. E.—"Anti-corrosive treatment for wrought iron and steel pipes and tubes." No. 10,956.

WILSON, J.—See Parkinson and W. & B. Cowan. No. 10,792.

WILTON, N.—"Treating gases with liquids." No. 10,816.

APPLICATIONS TO AVOID OR SUSPEND PATENTS OR LICENCES.

Grantee: JOHNSON (*Badische Anilin und Soda Fabrik*), "Ammonia." Applicants: GAS DEVELOPMENTS LIMITED. Patents No. 17,951 of 1909, No. 19,249 of 1910, and No. 5833 of 1911.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF LORDS.

The following further progress has been made with Bills:

Commons amendments to Bill considered and agreed to: Yeadon Water.

Bill Royal Assented: Yeadon Water.

HOUSE OF COMMONS.

The following further progress has been made with Bills:

Bill reported, with amendments: Newcastle-upon-Tyne and Gateshead Gas.

Bill as amended considered, and to be read the third time: Conway and Colwyn Bay Water Board.

The Northwich Urban District Council Gas Bill has been withdrawn.

Price of Coal (Limitation) Act.

Mr. NEEDHAM, on Monday last week, asked the President of the Board of Trade whether he was prepared to make any statement as to the Coalowners' Associations seeking permission from the Board of Trade to raise the standard limitation price of coal?

Mr. HARCOURT said that the only application at present before the Board of Trade for an increase of the standard amount under the Price of Coal (Limitation) Act was in respect of the collieries in the Forest of Dean district, and the Board were awaiting further information in regard thereto.

Production of High Explosives by the Low-Combustion Process.

Mr. FELL, on Tuesday, asked the Minister of Munitions if his attention had been called to the delay in the steps being taken by the Government to increase the supply of materials for the manufacture of high explosives by the low-combustion process; if the Government, under the advice of Professor Vivian B. Lewes, advanced money towards the installation of a plant for this process in Yorkshire; if, on the death of the Professor last October, the opposing interests got the upper hand, and the installation under construction was delayed; if he was aware that the Stettiner Chamotte Fabrik Actien Gesellschaft had since the beginning of the war put up in Germany eleven plants to work the low-combustion process for the production of explosives; and if the Government intended to carry through the proposals of Professor Lewes, or to abandon them in the interest of the high-temperature carbonization process which was in operation in this country at the present time.

Dr. ADDISON replied that the question of the production of raw materials for the manufacture of high explosives by the low-combustion process had been very carefully considered. This process does not produce metallurgical coke, and it was doubtful whether it produced the raw materials of explosives in as large proportions as the alternative process. In view of this fact and of the present urgent demand for this coke, it had been decided not to take further steps to secure the erection of low-combustion plant until the results obtained from the plant at present under erection had been thoroughly investigated. The Government advanced capital towards the cost of installation of the above plant, but serious delays had occurred in the completion of the installation. Such delays had been due to the failure of the company to construct the plant as arranged, and not to the death of Professor Vivian Lewes or to any conflict with opposing interests. He had no knowledge of the facts stated in the question as to the erection of low-combustion plants in Germany. If the low-combustion plant at present being constructed proved successful, the matter of arranging for the erection of further similar plant would be considered.

Mr. FELL: May I ask whether the facts as I state them in the question are not correct; and whether the Government are not taking grave risks in not, at any rate, thoroughly inquiring into this process?

Dr. ADDISON: I do not know how many factories there are in Germany. The Government have made careful inquiry into this matter; and we do not think ourselves justified in going beyond this one experimental plant at present.

American Trinitrotoluol for Sweden.

Sir R. COOPER, last Tuesday, inquired of the Under-Secretary of State for Foreign Affairs if he had official information showing shipments of 115,472 lbs. of trinitrotoluol from New York to Sweden; and, if so, had instructions been given to the Navy to permit such shipments to pass through to Sweden or other neutral countries in north-western Europe.

Lord R. CECIL replied that the answer to the first question was in the affirmative. The shipment was destined for the Swedish Government; and His Majesty's Government were informed in advance that it would be made. No general instructions of the nature indicated in the second question have been issued.

Oil-Washing Plant at Burton.—Moving the adoption of the Gas Committee's report at last week's meeting of the Burton-on-Trent Town Council, Alderman Lowe said, referring to a sum of £2000 for the provision of oil-washing and benzol plant, that this was a matter which was being undertaken to comply with the needs of the Ministry of Munitions. The Committee did not anticipate it would be a commercial success for the undertaking, and they did not expect to make any profit out of it; but it was their duty to the country to take the steps desired by the Ministry of Munitions. It was important that the work should be put in hand at once, and proceeded with as rapidly as possible; and he asked the Council to give the Committee power to carry out the work at a cost of £2000, which was an outside figure. The minutes were adopted.

MISCELLANEOUS NEWS.

GAS (STANDARD OF CALORIFIC POWER) ACT.

It will be of use for reference to reproduce the Act, as Royal Assented on Thursday week last, to authorize, as respects gas undertakings, the substitution of a standard of calorific value for a standard of illuminating power. The Act contains two amendments which were made in the Bill while in Committee of the House of Lords [*ante*, p. 171].

1.—(1) Where, by virtue of any Act or Order confirmed by Act of Parliament regulating the undertaking of any company, authority, or person authorized to supply gas in any area in the United Kingdom (hereinafter referred to as the undertakers), the gas supplied by the undertakers is required to be of a prescribed illuminating power, and the undertakers are liable to penalties in the case of the illuminating power of the gas provided by them being less than, or being less by a prescribed extent than, such prescribed illuminating power, then on application being made by the undertakers the appropriate Government department may, if they think it expedient, and subject to such conditions (if any) as they consider proper, including such variation as they may think desirable of the prescribed pressure at which the gas is to be supplied, by Order—

(*a*) substitute for the prescribed standard of illuminating power a prescribed standard of calorific power;

(*b*) exempt the undertakers from penalties in respect of a deficiency in illuminating power, and substitute for the provisions imposing such penalties provisions imposing penalties in the case of deficiency in calorific power; and

(*c*) substitute for the provisions as to testing for illuminating power provisions as to testing for calorific power;

and on the making of such an Order, the Act or Order regulating the undertaking shall have effect as amended by the Order.

(2) In considering the expediency of making such an Order, the Department shall have special regard to whether the undertakers have erected and worked, or are prepared to erect and work, suitable crude benzol recovery plant for the production of benzol and toluol.

(3) Before making an Order under this section, the appropriate Government Department shall require the undertakers to give public notice, in such manner as the Department may consider best adapted for informing persons affected, of the application for an Order under this section, and of the calorific standard proposed to be adopted, and as to the manner in which and time within which objections may be made, and shall consider any objections which may be duly made, and shall, where they think it expedient to do so, hold an inquiry, and the costs (if any) incurred by the Department in connection with the inquiry shall be borne by the undertakers.

(4) For the purposes of this section, "the appropriate Government Department" means—

(*a*) in cases where the undertakers are a local authority, the Local Government Board, or the Secretary for Scotland, or the Local Government Board for Ireland, as the case may be; and

(*b*) in any other case, the Board of Trade.

2.—This Act may be cited as the Gas (Standard of Calorific Power) Act, 1916.

COAL SUPPLIES.

BREAKDOWN OF THE COAL PRICE LIMITATION ACT.

Deputation to Members of Parliament.

The recent announcement of an increase of 2s. 6d. per ton in South Wales over the 4s. per ton allowed by the Coal Price Limitation Act [see "JOURNAL," July 18, p. 107] has caused the Committee of Representatives of Gas Undertakings formed at Manchester on May 18 last to take action. It was felt that the position is becoming so serious as to warrant immediate steps being taken to bring the position to the notice of the Government in an unmistakable manner; and with this object in view, gas undertakings were circularized to ask their members to meet a deputation and discuss the matter. The proposal secured a ready response; and things were brought to a head on Thursday last, when Committee Room 11 of the House of Commons was filled with members of Parliament, gas managers, and gas representatives generally—an hour's discussion resulting in a decision to immediately ask the President of the Board of Trade to receive a deputation.

Early in the afternoon, the Committee held a preliminary meeting to decide upon a course of procedure, when the following gentlemen were present: Alderman F. S. Phillips (Chairman of the Salford Gas Committee), Chairman, Alderman William Kay (Chairman of the Manchester Gas Committee), Councillor Gover Ford (Deputy-Chairman of the Nottingham Gas Committee), Alderman J. H. M'Gaul (Chairman of the Birkenhead Gas Committee), Alderman Penrose Green (Chairman of the Leeds Gas Committee), Alderman Herbert Wilde (Chairman of the Oldham Gas Committee), Councillor Carver (Leicester Gas Committee), Mr. Hubert Pooley (Gas Manager to the Leicester Corporation), Alderman Wade Deacon (Chairman of the Liverpool Gas Company), Mr. Thomas Goulden (Gas Light and Coke Company), in place of Mr. D. Milne Watson, who was prevented from attending, Mr. A. E. Broadberry (Engineer of the Tottenham Light, Heat, and Power Company and President of the Institution of Gas Engineers), Mr. Alexander Wilson (Engineer and Manager of the Glasgow Corporation Gas Department), Mr. F. A. Price (Superintendent of the Manchester Corporation Gas-Works) (Secretary), and Mr. Godfrey Kaye (assistant to Mr. Price).

It was decided that the position should be placed before members of Parliament by Alderman Kay and Alderman Phillips, supported by Councillor Gover Ford.

Keen and sympathetic interest was shown by the members of Parliament—about 30 attending, including Sir George Toulmin (Bury), who was elected to the chair, Mr. W. W. Rutherford (Liverpool, West Derby), Mr. James Parker (Halifax), Mr. J. E. Sutton (East Manchester), Mr. G. J. Wardle (Stockport), and Mr. E. R. Denniss (Oldham). Mr. Harry E. Jones was also present.

The facts laid before the members of Parliament clearly impressed them with the extreme gravity of the situation, and the intention was expressed of approaching the President of the Board of Trade the same afternoon.

Alderman KAY (Manchester) said he was somewhat reticent in coming before members of Parliament for a second time within twelve months, but circumstances had arisen which rendered this absolutely necessary. As a result of a conference of large gas undertakings on May 18 last, difficulties with regard to the supply of coal had to some extent been overcome; but gas undertakings throughout the country were now faced with a very much more serious problem. In their contracts with the collieries last year, gas undertakings were asked to include a clause which would give the collieries the right to add to the additional price of 4s. per ton under the Coal Prices Limitation Act any extra price which the Board of Trade might consent to as an increase over the figure of 4s. provided for under the Act. It now appeared that the Board of Trade in the South Wales district had agreed to a 2s. 6d. increase over the 4s., without giving gas undertakings or the large consumers an opportunity of stating their case. It was in these circumstances that the representatives of large gas undertakings now asked for the help and consideration of members of Parliament. Manchester was an example of what would be the effect throughout the country of such action on the part of the Board of Trade. An increase of 2s. 6d. over the 4s. provided by the Act would mean £60,000 increase in the total cost of coal used by the Manchester Gas Department—a figure which could not be viewed with anything but serious concern, inasmuch as it must mean an increase in the price of gas to their consumers, who numbered 200,000, and of whom 75 per cent. were the poorest of the poor. He therefore hoped that members of Parliament would support the request of the deputation that such increases as that granted in South Wales should not be given in future without the other side being heard.

Alderman PHILLIPS (Salford) said that when the Coal Prices Limitation Act of 1915 was passed it had a retrospective as well as a forward effect. Gas undertakings, both municipal and company, began making contracts about the beginning of February; and they ran in most cases to May 31, and in some instances into June. Although some contracts had been made at prices in excess of the 4s. allowed by the Act, most of those responsible for large undertakings, such as that which he represented, had been led to suppose that the Coal Price Limitation Act would only add 4s. per ton to the price paid in the qualifying period under the Act, and that any price charged above this would be returned. This, however, had not turned out to be the case, because the colliery owners apparently held the view that all contracts, in spite of the Act, must be a matter of compromise. The result was, generally speaking, that throughout the length and breadth of the country all contracts that had been made since the Act had been the subject of compromise, and the coalowners had received more money than they were strictly entitled to under the Act. The wording of the Act was unfortunately obscure, and it was essential that a clear and indisputable interpretation of it should be obtained. It was in consequence of the wording of the Act that it was necessary to compromise in order to get a supply of coal at all. One instance of the effect had already been given. Another was Glasgow, where the Gas Department carbonized 842,000 tons of coal last year; and they had to pay 5s. 3·6d. in excess of the price paid in the qualifying period, instead of 4s. according to their reading of the Act—*i.e.*, 15·6d. in excess of the 4s. This represented over £53,000 out of the pockets of the Glasgow ratepayers and gas consumers extra to what was allowed by the Act. This illustration could be multiplied from all parts of the country; and the difficulty was added to by the fact that such undertakings had not a free market, and could not go all over the country to different collieries. Further, it had been believed that if it were possible for a compromise to be arrived at on the basis of price, there would be no more difficulty as to supplies; but even this had turned out to be not the case. A very astute lawyer had been at work considering the Coal Price Limitation Act. On his advice the coalowners took the view that they were entitled to decide what was the basis price; and it was the determination of a basis price which had been the cause of the serious trouble from the very beginning. As an extreme case, the position was really this. If a colliery was supplying fifty consumers, and forty-nine of them were keen business men and would not pay any other price than that which seemed reasonable to a keen business man, but the fiftieth consumer was not such a keen business man and was willing to pay a higher price, then this higher price became the basis price for the purposes of the coalowners as against the whole of the fifty consumers. His own Gas Department had been asked to pay more than 4s. in excess of the price paid in the qualifying year; and, having refused to do so, the collieries had stated that they were not prepared to quote, or else said that they had no coal to offer. In other cases they said they would deal with the question later on in the year; and so the matter was put off on one pretence or another. Dealing specifically with Salford, he said the colliery they usually dealt with first offered to consider the matter; but as no progress seemed to be made, they were reminded later on. They replied that, although they would give the department some coals, they were not prepared to quote a price for a contract in the usual way, and that the department had better make an offer—say, 1s. 6d. per ton more than was provided for under the Act. The department refused to do this; and when they asked for coal, the reply was that the colliery had none to offer. Other members of the deputation could confirm this; and so it was that if a colliery was offered 1s., 1s. 6d., or 2s. per ton in excess of the price allowed in the Act, they could obtain the coal. It was clear, therefore, that the coalowners had not been loyal to the Act. They argued that the price to be paid in the second year after the passing differed from that paid

in the first year, and the result was that in Salford, compared with the corresponding period last year, they were now 25,000 tons short of their usual supplies, out of 160,000 tons; and the bulk of other towns were in the same position. It had been stated recently in the papers that Aberdeen had just completed their contracts for the current year at a price of 3s. per ton above the 4s. provided for in the Act. This must be a terrible burden for a place like Aberdeen. There was, however, something more even than this, and that was that generally throughout the country the coalowner, when he had arrived at a price with a customer, said he must also have a clause that during the existence of the contract, should the Board of Trade increase the 4s. limit, the consumer would undertake to pay that excess price for the coal remaining undelivered on the contract, whether the Board of Trade addition was retrospective or not. In the South Wales district, the Board of Trade had recently granted an increase of 2s. 6d. over the 4s.; but this was purely an *ex parte* grant. He understood from the newspapers that the Miners' Federation had asked to be heard, and that Mr. Harcourt had made an appointment, which, however, it was impossible for the Federation to keep. It had also been stated in the "Iron and Coal Trades Review" (the organ of the coalowners) that one of the grounds for this advance of 2s. 6d. was the increase of 15 per cent. given to the miners a short time ago. But Mr. Smillie, the President of the Miners' Federation of Great Britain, absolutely contradicted this, because he said that advances in miners' wages were not given in view of prospective possible prices of coal, but were given upon the coal prices realized. Therefore, if the coalowners during the last three months had got a certain sum of money, whatever it might be, which was above the price obtained when the wages had been previously arranged, the miners were entitled to a share in the excess; and this had been the case with the last 15 per cent. increase. If, therefore, the colliery owners were to do as they were undoubtedly doing—go to their customers and get a further increase above that agreed upon with the miners, and the miners then came and asked for an increase of wages, and the process was repeated—they were starting on a never-ending ladder. At any rate, he understood that the miners had now asked the Conciliation Board for an increase of wages. It would not be surprising if the miners did get something. But there was considerable danger if this was going on and no one was to know anything about it until it was suddenly announced that in some district the margin had been advanced. Then the large consumers and the public generally would be in a very serious position. At Salford, the accounts came out last year on the wrong side; and it could only mean that the price to gas consumers would have to be increased. There were 70,000 to 80,000 consumers in Salford, between 30,000 and 40,000 of whom were slot-meter consumers. Then, again, all gas undertakings were supplying the needs of the Government in the matter of high explosives, and were also giving large supplies to munition works; so that they stood at least second to munition works, even if they did stand second to them. Mr. Asquith himself had stated a few days ago that there was no doubt the Coal Price Limitation Act had been evaded, and that it had been in the mind of the Government that the Act had not been adhered to. There was, therefore, little doubt that the large consumers were powerless, and unless members of Parliament could bring influence to bear in the House, and prevent such increases being given as had been granted in the South Wales district, the burden would become intolerable. The late Sir Arthur Markham, himself a large colliery owner, had stated that 4s. was a substantial amount to grant to the coalowners; and everyone regretted that the death of Sir Arthur had deprived the deputation of the weight of his experience and support. Furthermore, it was being freely stated, both in the daily papers and in the papers representing the coalowners, that increases were fully expected in other parts of the country. The effect of this would be seen in the fact that if only two-thirds of the 18,000,000 tons of coal used in the gas industry per annum were subjected to 1s. increase, it would mean £600,000 per annum out of the pockets of the working people of the country; while if this amount of coal was subjected to 2s. 6d. a ton increase, £1,500,000 would be taken from the pockets of the public.

Mr. GOVER FORD (Nottingham), who supported the previous speakers, said that so far the case had been dealt with generally. But he wished to give some specific instances of the manner in which coalowners had dealt with a Gas Committee; and for that purpose he quoted figures of contracts recently entered into for coal by the Nottingham Gas Committee. As already stated, in common with other gas undertakings, the Nottingham Gas Committee were limited to a certain number of collieries, and could not get coal from all over the country. His first example he would call Contract A, which was for 15,000 tons at a price of 19s. 10d. per ton, or 6s. 5d. above the price paid in 1914, which was the basis price fixed by the Act. That was 2s. 5d. over the 4s.; and instead of being given the average supply, it was cut down by nearly 50 per cent. Contract B was for 6000 tons at 19s.; and in this case it was asked, as a condition of contract, that there should be a clause binding the Committee to take a similar quantity of coal for three years after the conclusion of the war at this huge price. The Committee, however, declined to accept the contract. Contract C was for 12,000 tons at 20s. per ton, or 8s. 2½d. above the 1914 price and 4s. 2½d. above the 4s.; the 12,000 tons comparing with 35,000 tons in 1914. Contract D was for 10,000 tons at 19s. 7½d., or 8s. 4½d. above the 1914 price, and 4s. 4½d. above the 4s. allowed by the Act; the quantity again being considerably reduced—namely, 10,000 tons as against 30,000 tons in 1914. In answer to a question, the speaker said no representations had been made to the Board of Trade, because they felt that they were so entirely in the hands of the colliery people, who could retaliate. Indeed, it had been more or less hinted that it was no use going to the Board of Trade, because if they did they would probably find themselves with still smaller supplies. Another contract (E) was for a quantity of coal at 6s. 0½d. over the 1914 price, or 2s. 0½d. above the 4s.; the actual quantity being 12,000 tons less than in 1914. In regard to this particular colliery, there was good reason to believe that the output had certainly not been decreased during the war. Finally the speaker referred to an instance of delayed coal deliveries. In 1914, a contract was placed with a particular firm for 60,000 tons, to extend over two years. In the ordinary way, this year the contract would have been renewed for another 25,000 or 30,000 tons; but the colliery was to-day 22,000 tons in arrear in deliveries. Hence the Committee had been told that they could not have a new contract, as they were already entitled to 22,000 tons under the old contract. And, furthermore, the colliery companies would now only undertake to give equal monthly supplies, whereas always in the past the arrangement had been for 60 per cent. during the winter months (when obviously more coal was being used) and 40 per cent. in the summer. The arrangement of equal monthly deliveries would make the position this winter very much more serious than in the past. The Nottingham Gas Committee were now paying £45,000 per annum more for their coal than in 1914; and if there was to be a general increase of 2s. 6d. on the 4s. in the Act, it would mean a further £17,000 out of the pockets of the consumers and ratepayers.

Mr. J. SUTTON, M.P., said he was not quite sure whether Alderman Phillips was correct in saying that the South Wales miners had asked to be heard in connection with the recent increase of 2s. 6d.; but he could say that the Miners' Federation had taken the matter up ardently, and were determined to pursue it for all they were worth. The 15½ per cent. increase already granted to the miners was on account of the fact that the coalowners had at that time already increased the price of coal by 3s. 6d. per ton. Different districts had different systems of dealing with these matters; but in the conciliation area, which included Lancashire, Yorkshire, Cheshire, and a number of other counties, an arrangement had been come to, when the Coal Price Limitation Act was passed, that there would be no more applications for wages increase during the next two years. This was on the assumption that the coalowners would not get anything more than the 4s. under the Act. But as the coalowners were getting higher prices, as had been indicated, the miners had already intimated to the President of the Board of Trade that if any advance was allowed to the coalowners the miners would break the agreement as to wages.

Mr. E. R. DENNISS, M.P., suggested that progress would be made more quickly if the members of Parliament present appointed a small Committee to arrange for the introduction to the President of the Board of Trade of a deputation, and, furthermore, the Minister of Munitions should be asked to attend on the occasion when the deputation was received. He had tried to get the coal trade brought under the Munitions Act, but had been told that this was impossible, on account of the danger of trouble with the miners.

Mr. G. J. WARDLE, M.P., said that if a deputation went to the Board of Trade it should go with a policy. In his opinion, the Board of Trade should have stronger powers to deal with these matters, but, having stronger powers, should exercise them in the public interest.

After a short discussion, the following resolution was carried:

> That a deputation of coal consumers be introduced to the Board of Trade by members of this House at an early date, to ask for an amendment of the Coal Price Limitation Act of 1915 and the removal of the grievances under which coal consumers now labour; and that the Minister of Munitions be invited to attend by the President of the Board of Trade.

For the purpose of giving effect to this resolution, the members of Parliament present formed themselves into an *ad hoc* Committee, and appointed the Chairman (Sir George Toulmin), Mr. E. R. Dennis, and Mr. G. J. Wardle as a Sub-Committee to make the necessary arrangements for the deputation.

The reason for asking that the Minister of Munitions should be invited to attend was that he is really interested as a large consumer, having regard to the maintenance of the supply of gas to munition works and also the supply of high explosives.

Alderman KAY expressed the thanks of the Committee of Gas Undertakings for the manner in which the members of Parliament had taken the matter up.

Kendal Gas-Works Results.

Mr. W. R. Wilson (the Engineer and Manager), in his report on the past year's working of the Kendal Corporation Gas Department, states that there is a gross profit of £4247; and after setting aside £3435 for interest and sinking fund charges, and £72 for war allowances, there is a surplus of £740, out of which £350 is to be devoted to paying for a tar dehydrating plant, and £150 is to go to the renewals fund. There were carbonized 8742 tons of coal and cannel; and the total cost of the coal delivered on the works was £9188, or 21s. 0·23d. per ton. The total quantity of gas made was 98,840,500 cubic feet, or an increase of 1·5 per cent. The amount sent out from the works, as per consumers' meters, was 89,320,000 cubic feet, or an increase of 5·17 per cent. Public lighting shows a decrease of 5,444,600 cubic feet. The erection of a Woodall-Duckham vertical retort setting was started in January, 1915; and the plant was put into operation on Jan. 1 last, and has since supplied the whole of the gas to the town, without hitch, leakage, or stoppage. The anticipated advantages and economies of carbonization in vertical retorts have been fully borne out in practice in every respect, and the guarantees as to quality, yield, fuel consumption, and capacity exceeded. The workmen have adapted themselves well to the new process, and have expressed appreciation of the improved conditions. The price of gas was raised on June 30 last year 5d. per 1000 cubic feet, and the increased revenue therefrom was £1580. The make of gas per ton of coal carbonized was 11,305 cubic feet, compared with 11,202 feet the previous year. In presenting the report to the Council, Alderman Monkhouse remarked that, as the accounts disclosed, they had had a very good year, largely owing to the benefit they had derived during the last three months of the period from the vertical retorts, which were working splendidly. The make of gas per ton was now larger than with the horizontal retorts. He paid a high tribute to the successful work of Mr. Wilson and his assistant, Mr. Shadbolt. Before the vertical retorts were constructed, the Manager had, he said, to overcome many difficulties.

Having considered the question of the charges to be made to consumers of gas for power purposes outside the parliamentary borough, the Stockton-on-Tees Gas Committee have decided that it shall be 6d. per 1000 cubic feet above the amount charged to power consumers within the area.

"Where does the Rubbish in every country come from?—

GERMANY."

This sign was displayed at the Volker Stall of the Gas Exhibition at Earl's Court in **1904.** At that time we were forced by the agitation (not to mention stale buns and bad tomatoes) of German Importers to remove it, but in season and out of season we have tried to show the **Menace** to the **Gas Industry** of the **Cheap German** Burners and **Mantles** which, dumped here, bring nothing but discredit on the Gas with which they are used.

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SOUTH METROPOLITAN GAS COMPANY.

The Ordinary Half-Yearly General Meeting of Proprietors was held on Wednesday last, at the Cannon Street Hotel—Mr. CHARLES CARPENTER, D.Sc., in the chair.

The SECRETARY (Mr. F. M'Leod) read the advertisement convening the meeting, and the minutes of the last ordinary and extraordinary general meetings.

The seal of the Company was affixed to the "Register of Proprietors."

THE CHAIRMAN'S ADDRESS.

The CHAIRMAN: I have now, ladies and gentlemen, to move—"That the report and accounts now presented be received and adopted, and the report entered on the minutes." The report and accounts have been circulated, and I assume you will follow our usual custom and take them as read. I will now deal with some of the more important items before formally moving their adoption. The first paragraph of the report of the result of the half-year's working makes it clear that we have made both ends meet with a little to spare. It must be remembered, however, that the dividend of £4 8s. per cent. we are now proposing to pay is less by £1 1s. 4d. per cent. than that declared two years ago, and that, by the increase in the price charged for gas to our consumers, we have been drawing upon them to a larger extent. The co-partnership bonus to our employees has also been considerably reduced; so that we may say that the present satisfactory balancing of the accounts has been provided by contributions from consumers, shareholders, and employees. Now it was in the same tripartite interest that we decided four years ago, with the acquiescence of the Official Auditor, to charge part of the cost of the national coal strike to our insurance fund. You will remember that we even had to go to America for some portion of our coal supplies, and that the extra cost to us was something like £90,000. We then took £75,000 from our insurance fund, which, I need not remind you, is one provided purely for contingencies arising out of our business. There is no doubt this fund should be built-up again as soon as possible; and we are going to do so. So much for paragraph one.

REDUCTION IN THE PRICE OF GAS.

When we come to the next, I can understand the criticism being made: "Are you not running too great a risk in reducing the price of gas by twopence per thousand?" I think not, and for the reason that we are now getting the freightage of coal more into our own hands. When war broke out, we were paying for freight from the North to London under 3s. per ton of coal. Then our ships were all commandeered by the Admiralty. I make no complaint as to this; they were modern in construction and admirably suited to their purpose. We had to charter others to take their place, and had to pay pretty heavily. Between four and five times the figure (for very awkward and unsuitable vessels) has been paid. "Oh, but," it is said, "look at the increased insurance charges, seamen's wages, bunkers, duration of voyages, &c." Well, we now know something of these matters first-hand; and after meeting all charges, we find our costs amount to under 4s. per ton—a very different figure to that charged by the Government. Remember, the figures are based upon war-time prices for ships. The competition to purchase either new or second-hand ships is very great, and they now command double or treble pre-war prices. But is there any wonder at this, when one considers the enormous profit of running? The fact of the matter is this business of shipping has been badly bungled. It should have been properly controlled long ago, as it might well and easily have been. We should then have been spared the reflection that those on whom the provision of the necessaries of life presses most hardly should have to contribute unduly to the cost of their carriage by sea. We are told there is a little cherub sitting up aloft looking after poor Jack. Where the interests of the shipowner are watched from I cannot say; but he must have powerful representation somewhere. Well, we see our way to reduce the price for gas out of the lower freight costs. Roughly speaking, 1s. per ton in freight is the equivalent of 1d. per 1000 cubic feet of gas. It has been a very great satisfaction to the Directors to be able to announce the reduction of 2d. per 1000 cubic feet. It carries out what has long been the policy that this Company have followed—namely, to lower the price charged for gas whenever there is an opportunity, and thus give the consumers the immediate advantage of improved working results.

CONSUMPTION MAINTAINED.

The next paragraph of the report deals with the consumption of gas, which has remained at pretty nearly the figure at which it stood a year ago. To be exact, it is nearly ¾ per cent. more. The domestic consumption has certainly been checked by the earlier hours kept and the reduction in the amount used in the public lamps. On the other hand, the industrial demand for gas has considerably increased—partly as the result of the war, and partly by reason of the fact that the convenience and economy of gas, even in large units of consumption, is being more and more realized by manufacturers. The net result has been that we have maintained our position as regards output under otherwise adverse circumstances. Gas can be used in many directions, and it is found there are compensating advantages which outweigh what at first looks like costly extravagance. For instance, cremation facilities are provided in South London, and, instead of a furnace with solid fuel, gas is substituted, which can be turned on, even in large quantities, by the opening of a valve at very little notice. It is not a pleasant example; but it is one of many which come under our notice, and not under that of the general public. Although, on the one hand, there are considerable reductions of gas for domestic purposes and shop lighting, it has been compensated for by the increased use of gas for industrial purposes.

THE OUTLOOK FOR RESIDUALS.

We have also been aided in our half-year's working by the returns from residual products, the most important of which is, of course, coke. Our coke business has passed through several interesting phases. At one time about half our production went to the Medway for cement making. We lost nearly the whole of this trade when rotary kilns were introduced, but found a useful substitute in the fuel markets of Northern Europe—the Scandinavian ports. These markets have, however, been interfered with owing to the general shortage of fuel in the country; and we have therefore been increasing our efforts to dispose of our make within the Metropolis, with, I am glad to say, promising results. We have been in negotiation with one of the largest users of coal in South London. These negotiations are nearly completed, but not quite; and this will make a material difference in the surplus coke we have for sale. The other two main products are tar and ammonia. With regard to these, I am glad to say we have been doing very well. While dealing with the coke question, I ought to say I think there is no reason to doubt that the gas companies will be much larger suppliers of solid fuel in the future than is now the case. I cannot believe that the Government will let the present system of burning raw coal go on much longer unchecked. We have certainly had an object-lesson of that in the present war; and we have now got to this position—that the products of distillation from coal are essential to the safety of the nation. Very much more will have to be done to provide these bye-products in future than has been done in the past—in other words, we must be in the position to be able to turn on the tap at any time and get the residuals for war purposes. We have had a considerable amount of time to get ready for what is popularly known as the "push." I cannot imagine that is always going to happen; and it is for the Government to call upon manufacturers of gas to produce the products of gas at a moment's notice. To do this, the coal resources of the country must be dealt with in a different way from what they are to-day. The solid fuel will first of all have to go through a process by which ammonia, light oil, benzol, and so on are taken out. In this connection, it will probably be interesting to state that we have used coke entirely for the past 29 years under the boilers of our river tugs, and it is extensively used for bunkering our steam-colliers. I do not know whether the policy adopted by Parliament, of putting the suppliers of gaseous and electric energy into competition, has not had its day; it may have. If one were to begin again, one would not do what one is doing to-day—viz., put up a large station to produce electric energy and another for gaseous energy. We should look to see whether these supplies should be undertaken separately, or whether there was not a great deal to be said on the point of economical working by running them together. There is no doubt the original idea of Parliament was that it was best for the suppliers to be in competition; but it must be remembered that the sliding-scale forms an admirable device for the stimulation of progress and for controlling the share of the profit to be taken by the shareholders. But I am afraid I am rather digressing from our particular report. There has also been an appreciable increase in the value of our other bye-products, both those of tar and ammonia, which there is every reason to believe will be maintained until the end of the war. When this time arrives, no one can foresee what may happen. But it is perfectly certain that British manufacturers will have to work together in much greater harmony than was the case in the past, both to avoid waste and reduce cost of production. A very good example of this is furnished by the distillation of tar. When we sold this product, I think it is pretty safe to say there was little or no collaboration with the distiller. He called the tar poor; and we felt he was crying "Wolf!" When we took over the matter into our own hands, we set to work to devise the best means of production conjointly with that of gas; and we succeeded in effecting considerable improvements. The result has been reflected in our products therefrom, some of which are taken as a standard of quality. I give you this as an example of the good to be derived from the coal distiller and the tar distiller working in harmony, and the instance is typical of many others. There is also the not less important matter of how far legislation can be utilized to support the efforts of the home producer. Fortunately, there is now in process of formation an Association of Chemical Manufacturers, whose province it will be to deal with these among many other matters. The case of tar distillation is only one of the subjects to be considered. One of the objects of the Association will be to encourage co-operative working in every kind of chemical industry.

LABOUR SHORTAGE.—EMPLOYMENT OF WOMEN.

Leaving the subject-matter of the next paragraph of the Directors' report, to which I will refer later on, I pass on to the sixth, which deals with the question of labour. We have, in common with all other employers, suffered considerable inconvenience from the reduced supply of labour, especially skilled. We are, however, employing an increasing number of females, and, as the report tells you, with satisfactory results in all cases. They are working as chemists, draughtsmen, meter and stove repairers, engine cleaners, lamp trimmers, burner attendants, and in many other capacities. Our principle of payment is to base the wages paid proportionally to the work done when compared with male labour. The proportion is generally about three to two, which makes the average rate of pay two-thirds that of men employed upon similar work. We have altogether some 400 now in our employ. They enter into the co-partnership as earnestly as the men. It must undoubtedly be the principle of co-partnership which is attractive to male and female labour alike; for, as regards monetary advantage, this is at a lower figure than it has ever been since it was inaugurated, now some twenty-seven years ago. Despite this, our employees are just as enthusiastic about it as ever; and we have letters from some of them serving King and country in different quarters of the globe speaking of its benefits, or how they have unexpectedly met a co-partner in distant climes. In a large number of cases our staff are working short-handed, and under trying circumstances, but in every instance with cheerfulness and earnestness.

MR. ROSTRON'S DEATH.

The final paragraph records the death of a gentleman who at one time promised fair to be one of the most useful members of the Board. Mr. Rostron served an apprenticeship in gas matters at the Parliamentary Bar, when he was concerned with the latter and pioneering legislation promoted by this Company. He was an earnest believer in co-partnership, and spared neither time nor energy in promoting its ideals, not only in London but other parts of the country. The Board have every reason to believe that many of his special qualifications will be found, with others, in Mr. E. Honoratus Lloyd, K.C., whose candidature for the vacancy the Board have had pleasure in supporting. The prominent position Mr. Honoratus Lloyd occupies at the Parliamentary

Bar, and his familiarity with the kind of legislation affecting gas undertakings, coupled with his clear commonsense, justify them in believing that the shareholders will not be likely to regret their choice if it falls upon him this afternoon.

SLOT-METER LOSSES.

Looking through the above notes, it occurs to me that there are perhaps one or two other matters on which a few words may be of interest. One is with regard to our slot-meter system. It speaks very highly, I consider, for those of our officials who have control of this that our loss by breaking them open has been but £130. The amount that we collect in slot-meters approaches nearly half a million sterling; and it is a remarkable thing—I am sure you will think so too—that with this system we have lost, through meters broken open, so small a sum.

WAR BONUS.

The other item about which I think I ought to say a word is the war bonus and war fund, which stands at £43,000. We have not raised wages since the outbreak of war—and we are right in adopting this principle—but we pay a war bonus, which is meant to meet part of the increased cost of living. We think the burden should be shared by the workmen as well as by the consumers of gas. It cannot be expected that we should have to pay the entire cost; but we make a substantial contribution to this in the shape of war bonus.

WAR FUND CONTRIBUTIONS.

Another item is our contribution to the war fund. This is a fund which has been provided by the workers themselves, in order that the dependants of those fighting should not suffer by reason of performing their military or naval duties. The fund is worked entirely by the workpeople; and no official could do it so thoroughly or economically and, at the same time, so sympathetically. We contribute from the funds of the Company an amount equal to that provided by the men; and we shall continue to do so. The total amount paid to dependants is £45,660. The whole of this has been paid through a Committee of employees; and I am certain I am right when I say that no £45,000 has been better spent than this has been by them. [Applause.] They look into every case, and deal with it on its merits; and the amount of contribution is one which the Committee think will best meet the requirements.

Now I think that is all I need deal with at this meeting. I beg formally to move the resolution for the adoption of the report and accounts.

The DEPUTY-CHAIRMAN (Mr. Frank H. Jones) seconded the resolution.

The CHAIRMAN: The matter is now open for discussion; and I shall be pleased to hear any remarks from shareholders.

REMARKS BY SHAREHOLDERS.

Mr. PADDON congratulated the Directors upon the excellent balance-sheet presented, and especially upon the statement in the report that the price of gas was to be reduced 2d. per 1000 cubic feet. This proved that the Directors had addressed themselves to the many difficulties that faced them, and that they had been successful in overcoming them. He was also pleased to see that Mr. Honoratus Lloyd was about to be added to the Board, as this gentleman possessed many qualifications which would be of great assistance to the Company. He invited the Board to recognize, and support, an important principle to be adopted after the war—viz., not to obtain anything whatever connected with the gas industry from any of the enemy countries. The gas industry in the past had neglected to look after things which might just as well have been manufactured in this country as abroad, and millions of pounds had been spent abroad which ought not to have been done. There was nothing connected with the gas industry which could not equally be as well made in this country as abroad; and he therefore hoped that never again would they, or any other company, buy anything from those nations which were doing their best to destroy this country. As had been stated, a large number of their employees were fighting on the battle field; and he trusted that, when they came back, their interests would be fully considered. English money should be handed to Englishmen only; and he trusted they would be patriotic and do without mantles and other things which could be just as well manufactured here.

Mr. HAVELOCK WEST wished to reiterate the congratulations of the last speaker, more especially as he noticed that at the present time freight was about 4s. a ton as compared with 11s. 6d. paid by another company. In the report, he noticed a statement that new steamships had been acquired, and he should be glad to be informed how many had been obtained. As the Company proposed to raise additional capital to the amount of £750,000, he trusted it would not be raised at the same low rate as on the last occasion. Referring to the proposed reduction in the price of gas, he said, being connected with two or three public bodies in South London who had to pay for gas, they were very pleased to see the announcement. In conclusion, he asked whether the Company had closed one of their establishments, or depleted it—he would not mention which one.

THE CHAIRMAN'S REPLY.

The CHAIRMAN: I will reply, first of all, to the last speaker, and deal with his last question first. It is quite true that for the moment we have shut-down one of our oldest works. It has been shut-down for a very good reason—viz., that these are not the most economical works—and in times like the present, when labour is a difficulty, we think it better policy to put the labour where it can be most profitably employed. We have transferred the great bulk of the employees to other stations, at rates not less than they received at the former works. What the future has in store for these works, we cannot say. We may have to start them again next winter, or after the war, or not at all. Though they have played an important part in the carbonization of gas, they are not our best works to-day; and, owing to the difficulty of obtaining an adequate supply of labour, we decided to close them temporarily. With regard to the question of ships, we have two new ones running satisfactorily I am pleased to find that, as a resident and public man in South London, Mr. West is satisfied with what we have done in the matter of reduction of price, and confirms the action we have taken. Now to refer to the first speaker. I am very sympathetic with regard to his remarks. We have had a good deal of experience in this matter, though, fortunately, we have not bought foreign incandescent mantles for many years. I need not remind the meeting that we were the only gas company who seriously tried to solve the problem of providing the rare earths from which mantles are made. No other company have done anything approaching it; we spent a lot of money over it. In regard to incandescent burners, we have made these in England for years past; and so, too, with the production of glass, we are now in touch with manufacturers in London. The main difficulty is with regard to chimneys; and we are endeavouring to follow the same policy with regard to these. One result of the war has been to wake British manufacturers up to the fact that they must do business in a different way in the future to what they have done in the past. There is a much more sympathetic feeling abroad; and the case of glass is in point. I think we should make up our mind to deal more in future with our own countrymen; and the meeting may rest assured that this will be the policy of the Directors.

The motion for the adoption of the report was put and carried.

THE DIVIDEND.

The CHAIRMAN: I have to move: "That a dividend at the rate of £4 8s. per cent. per annum be now declared, and that the warrants be transmitted to the registered addresses of proprietors by post."

Mr. W. H. CUPIT seconded the motion, which was carried unanimously.

THE NEW CAPITAL.

The CHAIRMAN: Next I have to move the resolution with regard to capital. The resolution is:

> "That the Directors be and are hereby authorized to raise the sum of £750,000 further capital by the issue of ordinary stock, preference stock, and debenture stock, or by any of those modes, in such amounts, at such times, and in such manner, as they may deem desirable, pursuant to the powers contained in the Company's Act of 1916."

You will remember that the reason for requiring the capital was, first, the automatic increase in the requirements of our business, and, next, the change in the requirements arising out of the war. The war has necessitated our having a larger amount of floating capital, because the cost of raw material which we have to buy (and pay for weekly) is higher than in ordinary times; and the amount of cash which was adequate in ordinary times is quite inadequate when one has to pay higher prices for coal, and similarly so with regard to our products. This condition, we hope, is temporary, and will pass away when the war is over. If not, we shall have to deal with it permanently. The other requirement is in respect of the permanent charges of our business. We have become shipowners; and I think it will be an extremely good investment. But still we have now to supply the capital. The Act of Parliament provides for what one might call temporary capital, and for permanent capital. The temporary capital is to the extent of half a million, which we are empowered to raise by mortgage bonds or debentures to be redeemed within seven years. We have power to issue permanent capital to the extent of £250,000 of ordinary stock and £100,000 of debenture stock. The Board have thoroughly in their minds the importance of the capital question. We have to work in accordance with the Act of Parliament; and stock is issued under these powers and it can be issued in no other way. The resolution asks you to give the Board authority to issue it as and when they think necessary—you must leave them to be the judges of that. But I can assure you that they will follow the same policy as in the past—that is, be as economical as possible in issuing new capital. It is to the advantage of shareholders, and also of the consumers; and the Board will not be likely to put their settled policy on one side. I formally move the resolution.

Mr. JOHN MEWS: I have much pleasure in seconding the resolution. You must leave it to the Board to determine, on the day, what the value of the stock is likely to be. Trouble was caused by the multiplicity of Acts of Parliament dealing more or less with the same matter; and that is why we have had to get the new Act. Our Acts began in 1842; and I shall be glad when we have a distinguished member of the Parliamentary Bar on the Board, when I hope he will secure a Consolidating Act, so that we shall know where we are.

Mr. HAVELOCK WEST said on the last occasion the stock was issued only to consumers and employees; and he thought the Board undertook to get power to alter this, so that the shareholders would be able to subscribe for the capital. He should be glad to know whether there was a clause to this effect in the Act.

The CHAIRMAN: We have got perfectly free power with regard to the issue of the new capital. It can be sold by tender, and will be issued in exactly the same way that stock is issued by similar undertakings. It was a happy accident that we were able to issue stock at all last year. Had it not been for a saving clause, we could not have issued the capital to the consumers in the way we did. It all arises from the fact that in one of our Acts it is provided that no stock is to be issued to the general public below par. Fortunately, there was a clause giving power to issue to the consumers. This we did, with the result which the shareholder has referred to.

The motion was put and carried.

ELECTION OF A NEW DIRECTOR.

The CHAIRMAN: That concludes the business of the ordinary meeting, and I have now to declare the meeting an extraordinary general meeting, in order that we may deal with the question of the vacancy on the directorate. I have already alluded to the loss the Board has sustained by the death of Mr. Rostron; and I do not know that I can add anything further. The object with which we are now meeting is to elect a gentleman in the place of Mr. Rostron; and the only candidate is Mr. Honoratus Lloyd, K.C., of the Parliamentary Bar. I have no hesitation in saying that the addition of Mr. Honoratus Lloyd to the Board of this Company will be a source of strength. We have discussed it from no other point of view than how we can strengthen the Board of Directors of the Company. Our responsibility does not get less as time goes on; and therefore we want the very best talent and ability on the Board that we can get. In supporting (as the Board do)

the candidature of Mr. Honoratus Lloyd, they are fulfilling the spirit and letter of what the Board set itself out to do—viz, to get the best knowledge and ability possible. I now formally move: "That Mr. Edward Honoratus Lloyd, K.C., be elected a Director of the Company in the place of Mr. Laurence W. S. Rostron deceased."

Mr. F. H. JONES: Knowing Mr. Honoratus Lloyd well, I have every confidence in seconding the resolution.

A SHAREHOLDER said he objected to any lawyer being brought into the management of a commercial concern. What they wanted was business men on the Board.

The CHAIRMAN: I quite understand your feeling. We have, however, in Mr. Honoratus Lloyd a man whom I have not the slightest hesitation in saying will be an extremely valuable asset to us. In an undertaking of this kind, it is not all buying and selling, or making gas and selling bye-products. We have to carry on business by reason of Acts of Parliament; and in the past we have had to modify and vary them, and I cannot believe we shall have less to do in the future in that respect. In fact, we may have a great deal more. Mr. Honoratus Lloyd has been familiar with gas legislation for a great many years. He has practically been concerned in most of the important Acts of Parliament that have been dealing with gas supply for many years past, and we cannot possibly say we are shut down in that respect. I can assure you that you will have no cause to regret the election of Mr. Honoratus Lloyd. He has acted for us in the Parliamentary Committee Rooms; and I have been greatly impressed by his integrity and commonsense. These advantages will far outweigh the disadvantages of having followed the profession of the law.

The resolution was put and carried unanimously.

The CHAIRMAN: That concludes the business of the meeting.

A SHAREHOLDER inquired what was the qualification of a Director.

The CHAIRMAN said it was the holding of £2500 of ordinary stock.

VOTES OF THANKS.

Mr. HAVELOCK WEST proposed a hearty vote of thanks to the Chairman for his lucid address.

A SHAREHOLDER, in seconding the motion, said he was glad to hear that the employment of female labour had been a success.

The motion was carried unanimously.

The CHAIRMAN: What we want is criticism and confidence. Both these things we find very valuable and helpful to us in carrying on the business. I thank you for this vote. Before I sit down I wish to propose a hearty vote of thanks to the officials and the staff who have had an arduous time, while the strain of their work certainly does not grow less. The only opportunity we have of thanking them is that afforded by these meetings; and I wish to express our deep obligation to the staff for the admirable way in which they have stuck to the business. I would like particularly to associate with this vote the name of the Chief Engineer, Mr. Gill, and Mr. M'Leod.

A SHAREHOLDER seconded the motion, which was put and carried.

Mr. G. M. GILL, on behalf of the engineering staff, thanked the Chairman for his kind remarks about the way in which the work had been done during the past six months, and the shareholders for receiving the motion so kindly. There had been many difficulties to contend with; but, thanks to the splendid way in which the staff and workmen pulled together, they had managed to get on very satisfactorily. A large number of females had been engaged; and he was surprised at their willingness to adapt themselves to the work. One interesting engineering fact was that the Company's steamships were being run exclusively on coke. Anyone with shipping experience would say that this could not be done. All he could say was it was being done at the present time.

Mr. F. M'LEOD, in replying on behalf of the clerical and commercial staff, said the vote just passed would be an encouragement to them all to look forward with confidence to the coming six months. He mentioned the fact that with bunker coals at 35s. per ton, a substantial saving was effected by running the Company's steamers on coke.

The proceedings then terminated.

Portsea Island Gaslight Company.

In presenting the accounts for the six months to June at the half-yearly meeting of the Company on Thursday, the Directors will report that the profit and loss account shows an available balance of £36,417, which enables them to recommend the declaration of a dividend for the half year at the rates per annum of 12 per cent. on the "A" and "B" shares, 11 per cent. on the "C" shares, 9 per cent. on the "D" and "E" shares, and 5 per cent. on the 5 per cent. (maximum) stock, less income-tax, leaving a balance of £19,343 to be carried forward. The quantity of gas supplied for public lighting was somewhat less than during the corresponding half of 1915, owing to the temporary discontinuance of a large number of street-lamps; but the sales for other purposes show an increase. The number of consumers continues to increase; and an additional quantity of hired appliances has been issued. The supplies of coal and oil, which have caused so much anxiety since the commencement of the war, have appreciably improved. Regular deliveries have been received for some time past, permitting of the normal pressure of gas being resumed in all parts of the district; and the Directors have every hope of being able to maintain a thoroughly efficient service throughout the coming winter. The Directors recommend the usual donations of £50 and £5 5s. to the Portsmouth, Portsea, and Gosport Hospital and the Portsmouth Eye and Ear Infirmary respectively; also the distribution during the ensuing winter of coke to the value of £100 among the poor resident within the limits of the Company's supply.

Leiston Public Lighting Contract.—The Lighting Committee of the Leiston Urban District Council reported at the last monthly meeting that they had considered a letter from the Gas Company, asking them to withdraw their notice to terminate the contract, and that a fresh agreement should be made, and the Council should purchase the lamps and fittings, and pay for all gas consumed by meter. The Council decided that the agreement should terminate.

SOUTH SUBURBAN GAS COMPANY.

The Ordinary Half-Yearly Meeting of the Company was held last Friday, at the Livesey Memorial Hall, Gas-Works, Lower Sydenham, S.E.—Mr. CHARLES HUNT, M.Inst.C.E., in the chair.

The SECRETARY (Mr. Wilfrid Wastell) read the notice convening the meeting; and the report and accounts were taken as read.

The CHAIRMAN, in moving the adoption of the report and accounts, said: Before commencing the few remarks I have to make upon this occasion, I should like to explain that the reason we are meeting here is that, as many of you may be aware, the De Keyser Hotel, which has been our meeting-place for a good many years, has been taken over by the Government, and is, consequently, at present not available. It occurred to us that, under the circumstances, the proprietors might desire to meet here rather than at some other place in town; and I think it will be agreed that we might easily be worse housed than in this building.

A GOOD INCREASE OF GAS SALES, DESPITE DRAWBACKS.

Perhaps the most prominent feature of the report is the announcement of so substantial an increase as 4·39 per cent. in the sales of gas, which is the more remarkable as occurring concurrently with an almost complete discontinuance of the public and shop lighting, the practice of economy by consumers generally, and the introduction of the Summer Time Act, which, for the last five or six weeks of the half year, reduced consumption to the extent, so far as can be ascertained, of something like three-quarters of a million cubic feet per week. Any increase at all under such circumstances would be almost unaccountable but for the gas-fire development of the last few years. Year after year large numbers of these fires have been fixed, apparently without any substantial addition to the consumption resulting therefrom. But it has now been made clear that only opportunity was wanting in order to justify the place which they now occupy in domestic economy. Such opportunity was furnished by the very unseasonable weather which was experienced during the second quarter of the half year, when a revival of consumption occurred in certain residential districts where there had previously been a falling-off. This will probably appear satisfactory to everyone concerned, although I ought to mention that not long ago the President of the Board of Trade addressed a circular to gas undertakings desiring them to urge consumers to reduce their consumption by about 10 per cent., in order that more coal might be available for export. It subsequently transpired that this was meant to apply only to gas used for lighting purposes. But such limitation did not make the suggestion any more practicable. As it is our duty, however, to assist the Government by any means in our power, and particularly in such an important matter as the saving of coal (on which so much depends at the present time), a circular was issued to our consumers asking for their observance of certain elementary precautions for the avoidance of waste in their use of gas; at the same time calling their attention to the desirability of using gas coke and also gas in place of raw coal, so as to assist in the supply of the bye-products which are required by the Ministry of Munitions. Before passing from this subject of gas consumption, it may be mentioned that during the summer months the greatest output, or what is termed the peak of the load, occurs in those hours of Sunday when it may be assumed that preparations for the midday dinner are in full swing.

CAPITAL EXPENDITURE AND BUSINESS EXPANSION.

As will be seen by reference to the accounts, a careful eye is being kept upon expenditure of capital; it being felt that the present is not the time to sanction any such that can be avoided or postponed without prejudice to the development of the undertaking. In the amount of capital already employed, as compared with gas sold, the Company was placed somewhat at a disadvantage by the amalgamation of 1912, owing to the heavier capitals of both the undertakings absorbed. This had the effect of increasing the capital of the united undertaking, as compared with that of the Company as it previously existed. Since that time, a good deal of development work has had to be done, including the linking-up of the various stations by a high-pressure main, and the securing of a suitable river-side site for manufacturing works when the need for this arises. The number of our consumers has also been increased by nearly 11,000, and that of heating appliances of all kinds let on hire by over 23,000—making the proportion of these to consumers more than 100 per cent., as compared with 79 per cent. in 1912. This is a record which speaks volumes for the efficient administration of our Sales Department; while it is no small satisfaction to find that, notwithstanding the large expenditure incurred, and the very abnormal conditions of the period, not only does the capital employed in relation to gas sales show no increase, but, on the contrary, an appreciable decrease, although its present figure of nearly £500 per million cubic feet sold may still be regarded as comparatively high.

COAL AND THE REVENUE EXPENDITURE.

At the head of the expenditure column of the revenue account is the huge sum of £119,940, representing the cost for the half year of coal and other gas-making materials. It is easily a record for the Company, and exceeds that for the corresponding half of last year by upwards of £28,000. Freight charges, averaging for the half year 15s. 1d. per ton, figure for a substantial amount; and it is very fortunate that we were not dependent upon sea-borne coal for more than a portion, albeit a considerable portion, of our supplies. As a small set-off to this large additional cost, that of repairs and maintenance of works is less by about £5000—a saving which, I need hardly say, has not been effected at the expense of efficiency. It simply arises through certain necessary repairs having been anticipated in previous half years. The total cost of manufacture, including coal, exceeds that of the corresponding half of last year by nearly £24,000, to which has to be added an increase of nearly £7000 in distribution charges, largely due to increased cost of materials, &c. There has been expended on war fund, bonuses, and allowances £3700 more than last year; while among those items of expenditure that may be described as miscellaneous, that for co-partnership is the only one which shows a substantial reduction. So far from this being a matter for congratulation, I am sure there can only be one feeling here to-day—namely, that of regret that the time has not yet come for

welcoming a substantial addition to the liability of the Company in this connection. The total increase of expenditure is £33,710.

THE REVENUE—INTERESTING ITEMS AS TO RESIDUALS.

On the other side of the account, the receipts for gas have increased by £23,056, due partly to higher prices, and partly also to the additional consumption already referred to. As was to be expected from the continued expansion of the business, rents of meters, stoves, and fittings, have increased by £1787; while receipts for residuals show the substantial improvement of £8165. Coke represents £6032 of this sum; and although the demand for this product has recently shown signs of falling-off, circumstances seem to justify the belief (which is generally entertained) that this will prove to be but temporary. I believe I may say that a revival has already taken place. Sulphate of ammonia contributes an addition of £2371, mainly due to a large demand for export. Apparently from a desire to encourage the use of this product by the British farmer, its export was, for a considerable period, prohibited by the Board of Agriculture; but the demand for this purpose improved upon the restriction being removed. Every effort was, and continues to be, made to sell as much as possible for home consumption, which grows but slowly, to provide for which it should not be necessary to compel the accumulation of large stocks to the detriment of producers. Tar alone has not contributed anything by way of counterpoise to the heavy additional expenditure for coal—in fact, the receipts from this residual show a falling-off, although only to a small extent. But that there should be this falling-off is a substantial answer to the rather widely entertained belief that gas undertakers are "making a good thing" out of the needs of the Government. This Company, at any rate, has certainly not made a single penny of additional profit out of what has already been done in this direction. So far from this being the case, the value of tar—the only product affected—instead of being enhanced, has actually declined since the war started.

THE FINANCIAL RESULT.

The result of the half-year's trading is a balance to be carried to net revenue account of £40,410, which is less by £837 than that of the corresponding half of last year; but sufficient, after payment of all interest charges, to pay the statutory dividends recommended, and to carry forward a balance increased by a fairly substantial sum, £6444.

BANK OVERDRAFT.

It will be noticed that the bank overdraft is just double what it was at this time last year. This is chiefly due to the difference in stocks, the values of which are greater by nearly £33,000. With a return to more normal times, these may be expected to diminish and correspondingly reduce the necessity for overdraft.

ALL RAILBORNE COAL NOW.

So very much has recently been said and written as to growing scarcity of coal, and the difficulty in obtaining supplies, that it is a great relief to be able to report the practical completion of our purchases for the next twelve months. It is an additional satisfaction to have, at the same time, bad good-bye to exorbitant freight charges; all the new coal being wholly railborne. The warning which was conveyed by last winter's experience in this respect was one that could not with impunity be neglected; and the new year had hardly commenced before inquiries were set on foot for coal from the Midland districts. Our first purchases of this coal were made quite early in January; and from that time almost to the present this most important matter has continuously engaged the attention of the Board. Our efforts have been rewarded by the securing of the necessary supplies at prices considerably less than would have had to be paid for Durham coal, including freight.

WASHING GAS BY OIL—GIVING FACILITIES FOR THE SUBSTITUTION OF FLAT-FLAME BURNERS BY INCANDESCENT ONES.

Paragraph No. 4 of the report refers to the Company having undertaken further work at the request of the Ministry of Munitions. This I may say, includes washing the gas with oil so as to increase the available supply of benzol, which will to some extent affect the illuminating power; but this, as you are aware, is no longer regarded as a satisfactory test of value; and I may remind you that fully three-fourths of the gas supplied by this Company has since 1912 been subject to a calorific value test. An Act has recently been passed empowering the Board of Trade to substitute calorific for existing illuminating power standards in cases where gas undertakers are assisting, or are prepared to assist, the Government in the desired direction. Practically the only part of this Company's supply which is likely to be affected by the oil-washing process is the quite inconsiderable portion of it which continues to pass through flat-flame burners. These, I need hardly remind you, have long been superseded for general lighting by incandescent burners giving more than ten times the light for equal consumption of gas. Depending also as they do for their lighting power largely upon the very substance—benzol—which is now being called for, and which is likely to be needed after the war as a substitute for petrol—the retention of such an extravagantly wasteful burner is clearly not desirable in cases where the more efficient type may be applicable. Accordingly we are urging consumers to use incandescent rather than flat-flame burners wherever possible, and are prepared to give every facility and assistance for this purpose.

AT THE FRONT—WAR FUND FOR DEPENDANTS.

Reference is made in the concluding paragraph of the report to the number of the Company's employees who have joined His Majesty's Forces. This has now increased to 302. The war fund which was instituted for the benefit of dependants has been drawn upon to the extent of £4054, of which £1329 relates to the half year under review. To this fund, as I believe you are aware, the Company contribute one-half; the other half representing the contributions of the employees (including the staffs), together with those of the Directors. The employees have from time to time very liberally increased their contributions to meet additional needs as these have arisen; and the Directors desire also to acknowledge the valuable assistance rendered them in administering the fund. It is proposed that any allowances payable to the dependants of those who have unfortunately fallen shall be continued until the end of the war, when the question of permanent allowances (if any) will come up for careful consideration. Much will necessarily depend on the Government scheme of pensions and allowances, which it is now hoped will reflect more nearly than at one time seemed probable the generally expressed desire that adequate provision shall be made out of the public funds in respect of those who are fighting for King and country, and—may I not add?—whose gallant achievements have filled all hearts with pride and gratitude.

THE WASTE OF COAL.

The DEPUTY-CHAIRMAN (Sir J. Fortescue Flannery, Bart., M.P.), in seconding the motion, said that he was sure the proprietors would agree with him that no speech by a company's chairman could be more appropriately treated by merely formally seconding than the speeches they were in the habit of hearing from their own Chairman. He went over the whole ground, and gave the information to the shareholders and to the world which was most useful at the moment. There were, however, just two points that he (Sir Fortescue) might perhaps venture to emphasize. The first was they were meeting that day in a place [the Livesey Memorial Hall] which was very convenient for the attendance of the working co-partners, who were thus facilitated in meeting together with the other co-partners whose work was not in the manufacture of gas. He was sure, looking at the portrait at the end of the room [one of Sir George Livesey], and the motto—"Whatever you would that men should do to you, do you even so to them"—that their departed master would gladly have known of this further and more intimate connection and intercourse between co-partners of both classes. This was of the very essence of the extending spirit of co-partnership; and he hoped it might be possible in the future to increase the facilities for the attendance of co-partners of both kinds at their general meetings, so mingling together for the common good. The other point to which he wished to refer was the substitution of the illuminating power standard by the calorific value one. All the time that he had been in the House of Commons—at any rate, since he became connected with the gas business—he had sought to support this change, but always in vain, until a few weeks ago, when those of the members of the House who had some understanding of the subject (and there were few of them) were satisfied to see the unanimous consent in Parliament to legislation providing for this substitution, so advantageous to all concerned, and so specially useful to the country at the present time, when the bye-products of gas manufacture were demanded by the War Office in as large a volume as it was possible to produce them. He did not know how far this legislation might be extended. It might be that some legislative restriction might be ultimately passed, in the national interests, in regard to the use of crude coal, both for economy and for obtaining the bye-products for the very necessary purposes not only of explosives, but also of dyeing and other uses. He did not look forward to this in the near future. But he felt it was one of the possibilities that might be considered as being well within the purview of the Legislature. He had pleasure in seconding the motion for the adoption of this satisfactory report; for it was satisfactory having regard to all the conditions. He was sure there was no part of the Chairman's speech which would be accepted by the proprietors with more enthusiasm, or be re-echoed by the public at large, more thoroughly than that in which the Chairman indicated the intention of the Company to make provision of a permanent kind for the widows and orphans of the co-partners who had fallen in battle, and who had rendered the greatest service and made the greatest sacrifice that men could possibly do.

Dr. SIDNEY TURNER also referred to the extravagant use of crude coal. He remarked that it was an absurd thing that one should waste something like 60 or 70 per cent. of the value of coal in order to get heat. He should like to see every gas undertaking in England issue some notice to the public showing exactly what was being done, and calling upon householders as patriots not to use crude coal, but only gas and coke, and so allow the other products to be employed for the benefit of the nation.

The CHAIRMAN said the Company had done something in this direction by issuing advice on the subject. [Dr. TURNER: It wants to be general.] The Directors would be very glad if Dr. Turner's remarks were widely circulated, so as to emphasize the extreme importance of the question.

The motion was unanimously carried.

THE DIVIDENDS.

Proposed by the CHAIRMAN, and seconded by Mr. GEORGE ROSS, a dividend was declared for the half year at the following rates per annum: 5 per cent. on the preference stock, 4⅝ per cent. on the ordinary stock, and 4⅜ per cent. on the West Kent ordinary stock—all less income-tax.

Mr. G. READ CLARKE asked whether there was any prospect of the price of gas being reduced. He saw the South Metropolitan Company had lowered their price.

The CHAIRMAN said the South Metropolitan Company had reduced their price; but the South Suburban Company had only been selling at the same price as the South Metropolitan Company, which was a much larger undertaking. He did not see how at present they were to reduce the price; but the moment they could do so, they would.

THANKS TO OFFICERS, STAFFS, AND WORKMEN.

The CHAIRMAN said he had another pleasing duty to perform, and that was to propose a very cordial vote of thanks to the staffs and employees generally for their care and attention during the past half year. He need not tell the proprietors how much depended upon the assiduity of their staffs and workmen—from Mr. Shoubridge and Mr. Wastell downwards to the humblest employee on the works. The Company were ably served throughout; and the thanks of the proprietors were doubly due to the officers and employees at a time of such anxiety as the present.

The motion, having been seconded, was heartily passed.

Mr. SHOUBRIDGE thanked the Chairman very heartily for the kind way in which he had referred to the services of the engineering staff and workmen, and for the endorsement of the proprietors. This would afford great encouragement to them to carry on under the trying conditions that existed at present. He should like to take the opportunity of testifying to the great assistance he had received from his chief

Assistant (Mr. Gorman), as well as Mr. Waller, Mr. Ross, and every member of the engineering staff. He wished also to testify to the great cheerfulness and willingness of all the workmen under his control. They had met every demand made upon them; and the demands had been very great owing to the shortness of hands. But the men had acted in the true spirit of co-partnership. He thought it was gratifying to all friends of co-partnership to find in these times of great stress and strain that it had come out as its founder had always anticipated it would do.

Mr. WASTELL, also in reply, said the clerical staff and the district staff would be more than gratified when they knew of the kind references to their labour. More than half of the clerical staff had laid down the pen for the sword; and it would be gratifying to those carrying on the work, handicapped as they were in respect of numbers, when he bore testimony to the efficiency, assiduity, and enthusiasm with which the women on the staff, whom they had had to bring in to help them, carried out their new duties. With the help of the women, and the remnant of the staff, he was sure there need be no fear as to the work being carried on efficiently during the remainder of the troublous times ahead.

A CO-PARTNER'S TRIBUTE.

Mr. H. W. HOOPER proposed, and Mr. G. R. CLARKE seconded, a cordial vote of thanks to the Chairman and Directors.

Mr. C. CARTER, in supporting it, referred to Sir Fortescue Flannery's remarks as to the facilities afforded to the workmen co-partners to meet with the other co-partners. He could assure them that the employee co-partners appreciated the favour of being able to attend these meetings. It was not a frequent occurrence for the ordinary workmen of a company to be in the position to attend and take part in the business of the half-yearly meetings. The fact that most of his fellow employees were so entitled to act was due entirely to the system of co-partnership. Under this system, up to the commencement of the war, prosperity had predominated; but since the beginning of the war, prices had increased, and other circumstances had arisen, which were pressing heavily on all sections. Consumers had to pay more for their gas, the ordinary proprietors had to be satisfied with less dividend, and the workers had to be satisfied with less bonus, which was, in fact, going down to vanishing point. In addition to this, the alarming increase in the cost of food had depreciated the purchasing value of their wages. Fortunately, they were blessed with a Chairman and Directors who were conspicuous in their consideration for the welfare of the employees. They had three times granted additional allowances to assist the employees to meet their increased expenditure. Seeing that the last increase had only taken effect that week, he did not think it would be inopportune if, on behalf of his fellow workers, he ventured to offer very hearty thanks to the Chairman and Directors for assisting them to bear the increased charges. He also referred to the various funds provided for the benefit of the workmen, and especially to the war fund for the assistance of the dependants of those fellow-employees who were fighting the country's battles. The participation of the workmen in the administration of these funds prompted the feeling of good will between the Company and themselves—a contrast to what usually prevailed outside. It was generally recognized that, after the war, there would be some acute industrial problems to be solved; and it was prophesied that the cleavage between capital and labour would widen. Those who were working under co-partnership had confidence that, should any problems arise in the gas industry, their system would enable it to be dealt with in the true interests of co-partnership.

The motion was cordially passed.

The CHAIRMAN, in the course of his acknowledgment, said he could assure Mr. Carter that any problems that might arise would be carefully considered by the Board in the true spirit of co-partnership.

Maidstone Gas Company.

At the annual meeting of the Company last Thursday, the Directors submitted the report and accounts for the twelve months ended June 30. The former stated that the trading year had again been remarkable for the high prices ruling for coal, oil, and materials generally. So much so that, since the issue of the last report, the Directors had been reluctantly compelled to increase the price of gas on two occasions—by 3d. per 1000 cubic feet as from the end of the September quarter, and by 6d. as from the end of the December quarter. Supplies of coal and oil were on the whole satisfactory; but the continuous scarcity of tonnage kept the rates of freight for these commodities at a high level throughout the year. This, with the rise in the cost of the raw materials, resulted in a serious increase under both these heads. The yield from residual products showed an all-round increase. There had been a shrinkage in the sales of gas as compared with the previous year. This was due to the fact that the troops quartered in the town during the winter months were not victualled by the inhabitants (a condition which helped the Company in the previous year), the restrictions of public and outside shop-lighting, and to a certain extent the effect of the Summer Time (Daylight Saving) Act. The accounts showed that, after providing for all fixed charges (including £2000 depreciation in respect of stoves and fittings, and £1400 to renewal fund), there remained an available balance of £14,049; and the Directors recommended the payment of a dividend at the rate of £5 3s. 6d. per cent. for the half year ending June 30, which, with the interim dividend at the rate of £6 4s. 6d. paid on March 1 last, made £5 14s. per cent. for the year. A duplicate set of generating plant for oil gas had been installed last autumn, and was working satisfactorily. Forty-four of the Company's employees had joined the Colours since the outbreak of war. Of these, the Directors recorded with regret that two have been killed and one is a prisoner of war.

Dublin Water-Works Investigation.—At a meeting of the Dublin Corporation on the 7th inst., it was decided to appoint a Committee to inquire into the position of the Water-Works Department, and to examine into all matters bearing on the reduction of expenditure, as recommended in a report of the Estates and Finance Committee, which had pointed out that the expenditure had increased in five years from £15,241 (1912-13) to £29,849 (1916-17).

WORKING STATISTICS FROM WIDNES.

Some Comparative Figures.

We have received from Mr. Isaac Carr, the Gas Engineer to the Widnes Corporation, the following particulars of the working of the undertaking for the twelve months ended March 25 last, with the corresponding figures for the preceding year. Comment upon certain of the statistics is made in the editorial columns of this issue [p. 292].

—	1915-16.	1914-15.
Coal carbonized, tons	42,865	40,420
Gas made, cubic feet	501,602,000	475,049,000
,, per ton of coal, cubic feet	11,702	11,750
Gas sold, cubic feet	483,136,000	465,098,000
,, per ton of coal, cubic feet	11,271	11,257
Leakage or unaccounted-for gas, per cent.	3·4	2·09
Coke sold and used at boilers at works, tons	27,256	24,090
Surplus coke sold per ton of coal	12 c. 2 q. 14 lb.	11 c. 3 q. 19 lb.
Illuminating power, candles	17·04	17·71
Sulphate of ammonia made, tons	441	452
,, made per ton of coal, lbs.	23·05	25·05
Tar made, tons	1,563	1,609
,, per ton of coal, lbs.	81·65	89
Number of consumers, ordinary	2,994	2,966
,, ,, ,, slot	5,423	5,153
Total	8,417	8,119
Number of gas-cookers, ordinary	1,231	1,211
,, ,, ,, slot	1,970	1,860
Total	3,201	3,071
Gas consumed, ordinary, cubic feet,	366,804,000	353,082,000
,, ,, slot ,, ,,	116,332,000	112,016,000
Total	483,136,000	465,098,000
Net profit	£2,731	£905 13 3
Cost of public lighting	£345	£1389 6 6
Net cost per 1000 cubic feet gas sold—	d.	d.
Manufacture and maintenance	4·892	4·50
Manufacture, maintenance, and distribution	5·881	5·51
Manufacture, maintenance, and distribution, including all charges	12·664	12·40
Gross capital	£198,040	£194,594
Net capital	£149,301	£145,856
Gross profit	£10,056	£8,080
Per cent. of net capital	6·7	5·54
Gross capital, per million cubic feet sold	£410	£418
Net do., do.	£309	£313

At the Monthly Meeting of the Town Council last Wednesday, Alderman H. S. Timmis (the Chairman of the Gas Committee) remarked that the profits were better than they had anticipated; and they still held the position of being the cheapest manufacturers of gas in the British Isles. The cost of manufacture and maintenance was under 5d. per 1000 cubic feet of gas sold; and the nearest competitor they had was just over 8d.

ALTERING THE STANDARD FOUR SHILLINGS.

The Weak Case for the Further Concession in South Wales.

The agitation that has arisen in connection with the alteration by the Board of Trade of the 4s. standard, by the addition of 2s. 6d., under the Price of Coal (Limitation) Act, so far as South Wales is concerned, has caused the following "official" defence to be issued by the District Coal and Coke Supplies Committee for South Wales and Monmouthshire. Its weakness lies in bare statement, without supporting data.

In view of the serious decrease in output from the mines due to the large number of men who have joined the Army and the increasing requirements of munition works, the Board of Trade requested the colliery owners in each coal-mining district of the United Kingdom to appoint a Committee to make the necessary arrangements to meet the demands of all home consumers. A Committee was appointed for the South Wales and Monmouthshire district; and this Committee have had to deal with the increasing requirements of munition works and to arrange generally for supplying home consumers. The decrease in the output of the Monmouthshire and South Wales coalfield, comparing the year 1915 with the pre-war year 1913, has been no less than 6 million tons.

The Price of Coal (Limitation) Act, 1915, came into operation on June 29 of that year. At the time of the passing of the Act, the South Wales owners intimated to the Government that the standard amount of 4s. provided by the Act, while possibly being adequate to other mining districts, was not a sufficient allowance for South Wales, owing to the larger increase in cost in this district as compared with the increase in other districts.

Shortly after the Act came into force, His Majesty's Government fixed the terms of employment for the workmen in the South Wales coalfield. These terms involved very large increases in the wage rates of all the workmen employed; and this had the effect of greatly increasing the cost per ton to the owners. The cost of pit wood, rails,

and all colliery stores has also advanced to a very large extent since July, 1915, and is continuously rising.

Taking into consideration the increased labour cost and the increase in the stores cost, the allowance of 4s. per ton made under the Act became so insufficient that it may be safely asserted that practically all the collieries supplying coal for home consumption were doing so at a loss. There are a number of companies in this coalfield supplying the whole, and many others supplying a very high percentage, of their output to home consumers. These companies informed the District Committee early in the year that they would be unable to renew contracts for supplies at the prices permitted under the Act, as such prices would mean that they would be working at a loss.

Detailed figures were submitted to the Board of Trade in March last, showing the average increase in wages and stores costs at collieries representative of more than half the output of the coalfield, and full particulars were also supplied of the increase in cost at a number of collieries the output from which is mainly supplied to home consumers. These figures were subjected to a rigorous investigation by the Statistical Department of the Board of Trade, and proved that the increase in cost had far exceeded the allowance of 4s. per ton.

In June last, the workmen's representatives made application for an advance of 15 per cent. in their rate of wages, which the Government conceded without any inquiry as to whether the advance was justified, and without giving the owners an opportunity of discussing the matter. This advance naturally had the effect of still further largely increasing the cost, with the result that collieries supplying for home consumption were in a much worse position.

In consequence of this, some companies immediately intimated that they would have to consider the question of stopping their collieries unless the standard amount of 4s. was increased by the Board of Trade to meet the extra cost. Since the Act came into force, the percentage payable to the workmen on their standard earnings has increased by about 35 per cent. It should be stated that a number of companies, more especially the larger ones whose accounts are made public, only benefit to a small extent by the extra 2s. 6d. just granted by the Board of Trade, for the reason that this increase only applies to coal sold for home consumption.

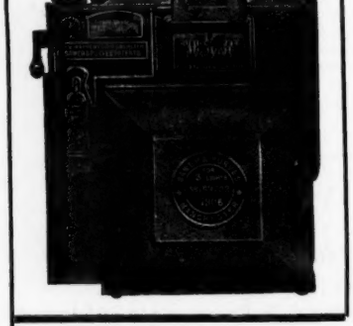
It would not have been necessary for the Committee to apply for a higher maximum if there had been no increase in the cost of production; but without this concession many collieries would have been compelled to close. It is thus proved that the increase granted is but a bare measure of justice to these collieries, made with the object of avoiding a serious diminution in the production of coal for the home trade.

The Portsmouth Town Council have decided, on the recommendation of the Finance Committee, that it be left to the Town Clerk to take any steps necessary to protect the Corporation's interests in connection with any application which may be made to the Board of Trade by the Portsea Island Gas Company under the Gas (Standard of Calorific Power) Act.

NOTES FROM SCOTLAND.

Airdrie Gas Supply.—Ex-Bailie Goldie (the Convener of the Gas Committee), in presenting the annual report of the department's work to the Airdrie Town Council, said he would like to express the Committee's appreciation of the efforts of the Manager (Mr. J. W. M'Lusky), and of the efficient and capable manner in which he had achieved such excellent results during a very difficult period. It had been necessary to extend the coal-store, because of the enormous stock they had to keep. The total quantity of gas made was 117,075,000 cubic feet, being 1·1 per cent. under last year. The coal carbonized was 10,196 tons, against 10,326 tons, representing an increased yield of 17 cubic feet per ton of coal; while the unaccounted-for gas was reduced from 7·18 to 6·35 per cent. The return from residuals was 9s. 6·18d. per ton of coal carbonized, against 7s. 11·2d. While the cost of coal had increased by 3s. 10·81d. per ton, the return from residuals was more by 1s. 6·98d. per ton. The statistics of gas sales revealed the interesting fact that, while ordinary meter sales had decreased 5·31 per cent., and public lighting was 44·35 per cent. less than last year, prepayment consumers had taken 7·34 per cent. more gas; and the quantity supplied to industrial-rate consumers had been increased by 11·78 per cent., making the net result a decrease of 0·12 per cent. on the entire output. The revenue of the department was £23,693, being an increase of £4185. The total expenditure was £15,964, leaving a balance of £7728. After meeting standing charges, and a debit balance of £1519 from last year, the net result is a debit balance of £38. Presenting the estimates for 1916-17, the Convener pointed out that the figures were based on a probable decrease of 5 per cent. in sales. Taking this with an extra £2000 in the coal bill, and increased wages, it was estimated, after allowing for a proportionate increased return from residuals, that the net result of the coming year's work would show a debit balance of £518. The Committee decided to adhere to the present rates for gas until November, when the Engineer could present a half-year's report. The Council unanimously adopted the report and the recommendation of the Committee. They also granted an increase of £25 in the salary of Mr. M'Lusky, in view of the excellent results of his first year's work in Airdrie.

Price of Gas at Dumfries.—At a meeting of the Dumfries Town Council, the Gas Committee recommended that the prices of gas be increased 2d. per 1000 cubic feet above those of last year. The proposed rates for 1916-17 are: Ordinary meters, 3s. 2d. per 1000 cubic feet; prepayment meters, 3s. 7d.; public lighting, 3s. 2d.; gas-engines, 2s. 11d. The Committee recommended that £1000 be placed to the credit of the reserve fund during the current year, and that the usual discounts (ranging from 2½ to 7 per cent.) be allowed from gas accounts. One member thought the practice of giving discounts should be discontinued. Contracts had been broken during the war, and they were told that people were receiving gas at less than cost price. Several members considered the discount too high; and the question was referred back to the Committee for further consideration. It was stated



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that during the past year the carbonizing results had been good; and though slightly less gas had been made, this was more than accounted for by the restrictions in public lighting, which in itself showed a reduction of over 4,000,000 cubic feet. The yield of gas per ton of coal and the unaccounted-for gas were equally good. In last year's estimates, a loss of about £2300 was anticipated; but this was wiped out, and a profit of £1324 made. The reduction in the price of coal brought about by the Coal Mines Prices Limitation Act, together with the increased rates secured for residuals, materially helped in the results obtained.

Crieff Gas Company.—At a meeting of the Crieff Gas Company, under the chairmanship of Ex-Provost Kerr, it was stated that the profit for the past year was £1538. A dividend of 7½ per cent. is declared, and the balance of £651 is set aside to meet the increased cost of coal and taxation. The quantity of gas consumed for the year to June 15 amounted to 26,205,600 cubic feet, an increase over the previous year of 1,228,600 cubic feet.

Fraserburgh Gas-Works Loan.—The Fraserburgh Gas Committee have obtained a loan of £26,250, at 5½ per cent. Developments are proceeding at the gas-works. The quantity of gas sold last year was 26 million cubic feet; and the charge is now 5s. per 1000 feet.

CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Sulphate.

LONDON, *Aug.* 14.

The values of tar products remain unchanged at the figures last recorded—viz.: Pitch, 20s. per ton, in bulk; creosote, 4d. to 4½d. per gallon, in bulk; 90-160 solvent naphtha, 2s. per gallon, naked; 48-50 per cent. anthracene, 3d. per unit, casks free; crude tar, about 2½d. per gallon, in bulk—all at makers' works, net cash.

Sulphate of ammonia continues firm; the export price for prompt delivery being £17 10s. per ton, net, filled into buyers' bags, at makers' works, for 25 per cent. quality.

Tar Products in the Provinces.

Aug. 14,

There is very little alteration in the market for tar products. Pitch remains in about the same position. Creosote is quiet, and reasonable prices are stated to have been accepted. Some business is reported in solvent naphtha. Heavy naphtha continues the same.

The average values of gas-works products during the past week were: Gas-works coal tar, 15s. 6d. to 19s. 6d. Pitch, East Coast, 16s. to 16s. 6d. per ton; West Coast, 15s. to 15s. 6d. Manchester; 16s. to 16s. 6d. Liverpool; 17s. to 18s. Clyde. Benzol, 90 per cent., North, 10½d. to 11½d.; 50-90 per cent. naked, North, 1s. 3d. to 1s. 4d. Toluol, naked, North, 2s. 3d. Coal tar crude naphtha, in bulk, North, 6½d. to 6¾d. Solvent naphtha, naked, North, 1s. 9d. to 1s. 10d. Heavy naphtha, North, 1s. 2d. to 1s. 3d. Creosote, in bulk, North, 2d. to 2¼d. Heavy oils, in bulk, 3⅞d. to 4d. Carbolic acid, 60 per cent., East and West Coasts, 3s. 4d. naked. Naphthalene salts, 75s. to 80s., bags included. Anthracene, "A" quality, 2½d. per unit; "B" quality, nominally ¾d.

Sulphate of Ammonia in the Provinces.

LIVERPOOL, *Aug.* 12.

During the past week there has been little change in either the tone of the market or in the value of this material; but in some instances producers have made a small concession in prices for prompt delivery, when desirous of reducing their stocks. Quotations for August delivery are repeated at £17 10s. per ton f.o.b. Hull, £17 17s. 6d. f.o.b. Liverpool, and £18 f.o.b. Leith. The volume of business in the forward position does not seem to have been large; but it has transpired that the equivalent of £18 5s. per ton f.o.b. good port has been paid for October-March in equal monthly quantities.

Nitrate of Soda.

There has been no alteration in this market, and the prices required on spot are still 17s. 6d. per cwt. for ordinary quality, and 18s. for refined.

Sulphate of Ammonia.

From another source, it is stated that for this article quotations are as follows: Outside London makes, £16 15s.; Hull, £17 10s. to £17 12s. 6d.; Leith, £17 15s.; Liverpool, £17 15s.; Middlesbrough, £17 12s. 6d.

High-Pressure Fitter and Exemption.—The Wrexham Gas Company applied for conditional exemption in respect of Frederick Rogers, aged 30, who had been in their employ for the past 15½ years as a gas-fitter. The man was stated to be a skilled fitter, and was engaged on important work in connection with the gas supply in the town and district. He was the only fitter engaged on the spot who could do the particular work which he did. It was impossible to replace him at the present time, as they had 22 men from the staff serving in the army, and others had gone into munition works. The man had been trained for high-pressure work. The Company had no other man to train. If this man had been a fortnight older, he would have been allowed to retain his badge. He was exempted until Sept. 18, no further application to be made without the Tribunal's consent.

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COAL TRADE REPORT.

Northern Coal Trade.

The coal market is rather quiet, and there is a good output of coal with a full export, especially to some of the French ports. The prices are steady generally; but there seems now to be some expectation of further arrangements of the control of prices or freights. In the steam coal trade, best Northumbrians are from 47s. 7d. to 50s. per ton f.o.b.; second-class steams are a little more plentiful at 41s. to 45s. per ton; and steam smalls are 25s. to 28s. per ton. Licences for export of coals to France are issued with tolerable readiness. This steadies the market; while there seems a stronger forward trade, with an output that is about an average of late. In the gas coal trade, the supply seems not to leave so much margin; and the prices are firm. Best Durhams are from 36s. per ton f.o.b.; and second-class gas coals are from 33s. to 34s. per ton. "Wear Specials" are from 37s. 6d. to 40s. per ton f.o.b. There are few new contracts for gas coals now being arranged. For one reason, the surplus available for sale is small, and the deliveries on the contracts that are running will be increased as the autumn nears. There is also the difficulty as to prices—the advances that have taken place in the rate of the Durham miners' wages having considerably increased the cost of the production of coals, though it is true that the realized price for coal is higher than it has ever been previously in the county. Freights on gas coal may be put as from 11s. 6d. to 12s., Tyne to London; and to the French ports, the controlled rates are shown by Tyne to Rouen 27s. 6d., and to Dunkirk 28s. 6d. But to the Mediterranean, the figures are still high, though with the expectation of lower rates referred to previously. There is a good inquiry for coke; and the home use seems increasing as well as the export trade. Good gas coke is a little enlarged in the make, but is well taken up, and may be quoted as from 33s. to 34s. per ton f.o.b. in the Tyne. The rates of freight on coke are a little lower than they were, but are still high, even to the scheduled French ports.

Cambridge University and Town Gas Company.

The gratifying statement was made by the Chairman (Mr. J. B. Peace), at the half-yearly meeting of the Company last week, that, although they were faced with higher prices for coal, with the experience of the past year to guide them, the Directors had come to the conclusion that they could safely reduce the price of gas 2d. per 1000 cubic feet as from the end of the past quarter, making the charge 2s. 10d., and bringing it within 3d. of the pre-war price. The report showed that since the commencement of the war, 88 employees had been mobilized or had joined the forces. The revenue account showed receipts for the half year ended June 30 amounting to £50,201, as against £47,272 for the corresponding half of 1915; while the expenditure was £42,062, compared with £40,089. There was a balance carried to profit and loss account of £8193, against £7183. The quantity of gas sold was 220,753,400 cubic feet, which compared with 239,525,600 feet a year ago. The Chairman, referring to the accounts, said they showed that, in spite of the extraordinarily difficult times they were passing through, the affairs of the Company continued in a satisfactory state. The make of gas was less than that for the corresponding half of the previous year by 18,000,000 cubic feet. The reduction of public lighting and the Summer Time Act accounted for a good deal; but the fact that the number of private consumers was down by 159 pointed in the same direction, and was an indication of the state of affairs in the town. On the other hand, there was a fair increase in the number of slot-meters and slot-cookers; and heating-stoves had held their own. They were asked, in view of the needs of the country, to take steps to separate the valuable products which passed into the tar; and they erected, and were now operating, a tar-distilling plant. Later on attention was given to the gas itself, which was far richer in these products than was the tar; and they were requested to erect plant for the purpose of dealing with the gas. They had taken considerable pains to find out the most effective plant for the purpose; and this was now on order, and the cost had been provided for. As it was anticipated that the washing of the gas might reduce it below the legal standard, they approached the Corporation, who, with characteristic public spirit, at once agreed to hold them absolved from breaches of the Act caused by their efforts to meet the public requirements. After the report had been adopted, Mr. Stace proposed a vote of thanks (which was agreed to) to the Directors and officers—paying a high tribute to the work of Mr. J. W. Auchterlonie, the Engineer and Manager.

Decreased Consumption at Shrewsbury.—The profit on the working of the Shrewsbury Gas Company for the year ended June 30 amounts to £7474. During the twelve months there has been a decrease of 10 million cubic feet in the consumption of gas. An interim dividend of 2½ per cent. (less income-tax) has been paid; and at the forthcoming annual meeting, the Directors will recommend that a final similar dividend, making 5 per cent. for the year, be declared. The number of stoves on hire at June 30 was 5009; and there were 4581 prepayment meters in use.

Eastbourne Gas Company.—The report of the Directors of the Company states that the revenue account shows a profit for the past half year of £6358. There is a balance of £8730 at the credit of profit and loss account, after payment of the half-yearly dividend in February last, and other charges. The Directors therefore recommend that a dividend for the past six months be declared at the rate of 7½ per cent. per annum upon the £65,000 "A" stock, at the rate of 5⅝ per cent. per annum upon the £198,000 "B" stock, and at the rate of 5 per cent. per annum upon the £3150 5 per cent. preference stock, which will absorb the sum of £7963, and leave a balance of £767 to be carried forward. Arising from the increased cost of coal and oil, the Directors decided to increase the price charged for gas by 2d. per 1000 cubic feet at the end of the March quarter. The contracts since entered into constitute a still greater increase in the cost of gas-making materials; and a further increase in the charge for gas is, they say, unavoidable.

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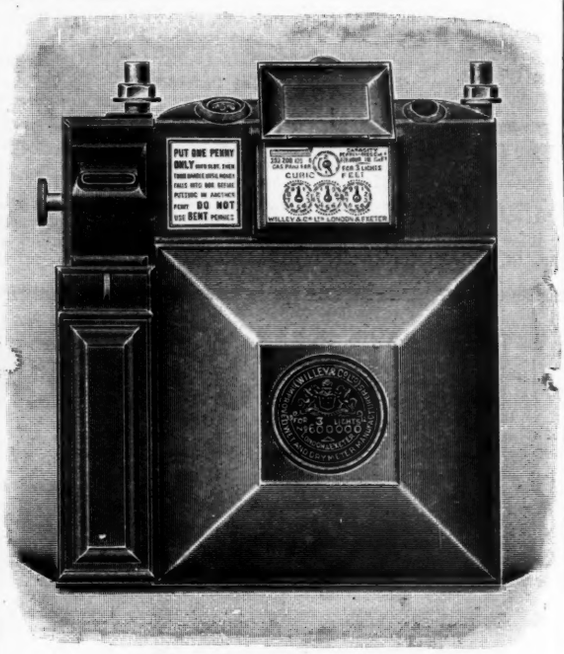

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Ilkeston Gas Undertaking.—The Mayor of Ilkeston (Mr. J. A. Macdonald), who is also Chairman of the Gas Committee, was able to make the satisfactory statement, at the last meeting of the Council, that the Committee had been successful in completing contracts for the supply of coal at an advance in price of about 6d. per ton only.

Leatherhead Gas and Lighting Company.—It was reported at the annual meeting of the Company that the receipts for the year ended June 30 amounted to £20,093, and the working expenses to £16,002, leaving a profit of £4091, to which had to be added £1945 brought from the previous year, making a total of £6036. Out of the sum available, the Directors recommended the payment of a final dividend of 3 per cent., making, with the interim distribution, 5½ per cent. for the year. This will leave £2092 to be carried forward. The final dividend will be subject to the deduction of income-tax for the whole of the year. The report of Mr. F. S. Cripps (the Consulting Engineer) stated that toluene extracting and tar dehydrating plants have been installed at the request of the Munitions Department. This has necessitated additional condensing apparatus and other accessories. A tar-tank, to store 35,000 gallons, is in course of erection. To admit of these extensions, the works have been enlarged by the purchase of a small strip of land on satisfactory terms.

Primitiva Gas Company of Buenos Ayres.—In their City Notes last Tuesday, the "Evening Standard" published the following paragraph: Some hope for shareholders in the Primitiva Gas Company is contained in a letter appearing in the "South American Journal" from an Argentine correspondent. The Municipality owe the Company roughly £100,000 for public lighting, which at the present moment they are unable to pay. The Municipality are wealthy enough, says this correspondent, so that the debt is sure of being paid eventually. But owing to the building of new avenidas the municipal finances have run very low; and as, owing to the war, no new loans can be effected, there is, for the time being, no wherewithal to pay the Company. The Municipality, it is claimed, will eventually pay with interest, at a rate which will be mutually agreed upon, as soon as matters right themselves and the state of impecuniosity is overcome. The Company's £5 ordinary shares, which have received no dividend since October, 1914, now stand at about 42s. 6d., and the £5 5s. per cent. cumulative preferences, on which the June dividend was passed, are quoted about 70s. At these prices, they appear fair lock-up speculations, since the payment of the municipal debt should enable the Company to clear off the preference arrears and thereafter make a small distribution to the ordinary shareholders.

STOCK MARKET REPORT.

THE Stock Exchange last week opened much under the somnolent influence of the extreme quietude of the week before; and for the first half business was on a very restricted scale. It looked as if we were in for a regular holiday time of it, with its attendant dulness of markets. But before Wednesday was over, a pleasant change set in. The war news was too good to be resisted, and the dulness gave way to marked cheerfulness. Markets grew more active, and gathered strength as buyers came in; and as the gratifying despatches from all the seats of war succeeded each other daily, so the bright tone of the markets endured to the end. It may be added that Mr. M'Kenna's financial statement in Parliament contributed in a measure. The gilt-edged group made a nice recovery from depression. The War Loan marked 96 7/8 several times, and Consols 59 5/8. Home Rails were in better demand; but operations were not numerous. Americans were rather uneven; but Argentines showed more firmness. The Foreign Market was noticeable for the strength of French, Russian, and Japanese. South Africans had a good time, notwithstanding some realization of profits. In the Miscellaneous Market, shipping concerns formed the chief points of interest, but at times moved irregularly. Business in the Gas Market was very quiet; but the tendency was quite firm throughout the list. It is evident that the proceedings at the many important company meetings already held have tended to impart confidence in the future. Primitiva shareholders will read with pleasure the message of the President of the Argentine Republic to Congress, in which he referred to the financial position of the Buenos Ayres Municipality, and expressed regret at the unavoidable delay incurred in the settlement of its liabilities, the postponement of which tended to impair the credit of the Municipality. He added a hope and belief that normal conditions will prevail within a relatively short space of time. The Wandsworth Company will pay full statutory dividends, as before. The Portsea Company will pay dividends at the rate of 12 per cent. on the "B" shares, of 11 per cent. on the "C" shares, and of 9 per cent. on the "D" shares.

[*Erratum.*—In last week's report, the statement that "our gold operations are to be so restricted" should have read "the public announcements of our gold operations are to be so restricted."]

Bargains done for cash during the week were as follows: On Monday, Gas Light ordinary 79½, 79¾, ditto debenture 61, Imperial Continental 90, 91, Metropolitan of Melbourne 98, Oriental 108¼, 108¾, Primitiva 42s. 6d., ditto preference 68s. 9d., 70s., Tottenham "B" 92½. On Tuesday, Commercial debenture 57, European 13⅛, 13½, Gas Light ordinary 79, 79¼, 79½, 79⅝, 80, ditto 10 per cent. bonds 186 7/16, 187, Primitiva preference 68s. 1½d., South Metropolitan 83¾, 84½, 85. On Wednesday, European 13⅜, Gas Light ordinary 80, Primitiva preference 67s. 6d., 68s. 9d., 69s. 4½d., South Metropolitan 85. On Thursday, Gas Light ordinary 80, 80⅛, ditto maximum 61, 61½, Imperial Continental 90, ditto debenture 65, South Metropolitan 85¼, 85⅝. On Friday, Gas Light ordinary 79¼, 79½, 80, 80¼, Imperial Continental 90, South Metropolitan 85⅝.

The Bank rate is 6 per cent.—as fixed on July 13.

ANTE-WAR PRICES AND DIVIDENDS, LATEST DIVIDENDS, AND LAST WEEK'S BARGAINS.

Issue.	Share.	When ex-Dividend.	Previous Div on Issued & Bonus.	Last Dividend.	NAME.	Closing Prices, July 26, 1914.	Yield on Highest Closing Price.	Lowest and Highest Prices of Bargains.
£			p.c.				£ s. d.	
175,472	Stk.	Mar. 10	4	4	Aldershot 4 p.c. Pref. .	..	—	..
1,551,868	,,	April 8	2½	5⅓	Alliance & Dublin Ord.	59—64	3 18 2	..
874,000	,,	July 10	4	4	Do. 4 p.c. Deb.	76—79	5 1 3	..
280,000	5	April 29	7½	8/-	Bombay, Ltd. . . .	5⅞—6⅜	5 17 8	..
60,000	10	Feb. 26	16	15/-	Bournemouth Gas and Water { 10 p.c. .	29—30	5 6 8	..
383,110	10	,,	7	7/-	B 7 p.c. .	15—15½	4 10 4	..
116,000	10	,,	6	6/-	Pref. 6 p.c.	13½—14	4 5 9	..
153,740	—	—	—	4	4 p.c. Deb.	..	—	..
992,045	Stk.	Feb. 26	†14	56/-	Brentford A Consold. .	261—266	5 5 3	..
734,920	,,	,,	†11	55/-	Do. B New . .	204—209	5 5 3	..
55,000	,,	,,	5	5	Do. 5 p.c. Pref. .	109—111	4 10 1	..
221,400	,,	June 11	4	4	Do. 4 p.c. Deb. .	91—98	4 6 0	..
217,980	Stk.	Feb. 26	11	10⅔	Brighton & Hove Orig.	208—213	5 3 4	..
244,200	,,	,,	8	7⅔	Do. A Ord. Stk. .	154—159	5 0 8	..
690,000	20	Mar. 26	12½	22/6	British	44—45	5 11 1	..
190,000	Stk.	June 26	4	4	Do. 4 p.c. Deb. Stk.	88—90	4 8 11	..
245,771	Stk.	June 26	4	4	Buenos Ayres 4 p.c. Deb.	85—87	4 12 0	..
100,000	10	—	—	—	Cape Town & Dis., Ltd.	1½—2½	—	..
100,000	10	—	—	4/6	Do. 4½ p.c. Pref. .	4—6	—	..
100,000	Stk.	June 26	4½	4½	Do. 4½ p.c. Deb. Stk.	70—75	6 0 0	..
157,150	Stk.	Feb. 26	5	5	Chester 5 p.c. Ord. . .	108—110	4 10 11	..
1,618,280	Stk.	Feb. 12	5/9/4	49/4	Commercial 4 p.c. Stk.	106—108	5 1 2	..
560,000	,,	,,	5½	46/8	Do. 3½ p.c. do. .	103—105	5 1 6	..
475,000	,,	June 11	3	3	Do. 3 p.c. Deb. Stk.	69½—71½	4 3 11	57
800,000	Stk.	,,	4	—	Continental Union, Ltd.	76—79	5 1 3	..
200 000	,,	,,	7	—	Do. 7 p.c. Pref.	115—118	5 18 8	..
278,400	—	—	—	11½	Croydon B and C 7 p.c.	..	—	..
—	—	—	—	—	Do. E	..	—	..
492,270	Stk.	—	6	5⅔	Derby Con. Stk. . . .	123—126	4 16 0	..
55,000	,,	—	4	4	Do. Deb. Stk. .	102—104	3 16 11	..
1,009,180	10	July 29	10	10/-	European, Ltd. . . .	17½—18	5 11 1	13½—13¾
16,318,430	Stk.	Feb. 10	4/17/4	42/-	Gas Light and Coke { 4 p.c. Ord. . .	98—102	4 15 6	79—80½
2,600,000	,,	,,	3½	3½	3½ p.c. max. .	76—79	4 8 7	61—61½
4,062,285	,,	,,	4	4	4 p.c. Con. Pref.	96—99	4 0 10	..
4,674,850	,,	June 11	3	3	3 p.c. Con. Deb.	72¼—74½	4 0 6	61
130,000	,,	,,	10	10	10 p.c. Bonds .	..	—	186 7/16—187
258,740	Stk.	Mar. 12	5	4½	Hastings & St. L. 3½ p.c.	87—89	5 12 4	..
70,000	10	April 29	11	6	Hongkong & China, Ltd.	16½—16⅞	6 11 4	..
86,800	—	—	—	9½	Hornsey 7 p.c. . . .	..	—	..
181,000	Stk.	Mar. 12	7½	7⅜	Ilford A and C . . .	151—154	5 2 4	..
65,780	,,	,,	6⅜	5⅞	Do. B	115—119	5 8 0	..
65,500	,,	June 26	4	4	Do. 4 p.c. Deb. . .	92—94	4 5 1	..
4,940,000	Stk.	May 14	9	4½	Imperial Continental .	150—160	5 12 6	90—91
1,285,000	Stk.	Feb. 12	8½	3½	Do. 3½ p.c. Deb. Red.	84—86	4 1 5	65
235,342	Stk.	Mar. 12	6½	6½	Lea Bridge Ord. 5 p.c. .	119—121	5 7 5	..
2,498,905	Stk.	Feb. 26	10	5	Liverpool 5 p.c. Ord. { A B	211—213 / 145—148	4 18 11 / 4 14 7	..
806,083	,,	June 26	4	4	Do. 4 p.c. Pr. Deb. Stk.	..	—	..
75,000	5	June 11	6	2/-	Malta & Mediterranean	4½—4⅝	6 9 9	
250,000	100	April 1	4½	4½	Met. of Melbourne 4½ p.c. Deb.	99—101	4 9 1	93
541,920	20	May 28	4	6/-	Monte Video, Ltd. . .	11½—12	6 13 4	..
1,875,892	Stk.	July 29	4½	4½	Newc'tle&G'tesh'd Con.	98½—99½	4 10 6	..
539,705	Stk.	June 26	3½	3½	Do. 3½ p.c. Deb.	83—88	4 4 10	..
55,940	10	Feb. 26	7/14/0	7/8⅔	North Middlesex 7 p.c.	14—15	5 2 8	..
900,000	Stk.	May 14	8	8	Oriental, Ltd. . . .	117—122	6 11 2	108½—108¾
60,000	5	Mar. 26	10	1/-	Ottoman, Ltd. . . .	7½—7⅞	6 9 0	..
60,000	50	Feb. 26	13	65/-	Portsea, Island B . .	128—131	4 19 3	..
100,000	50	,,	12	60/-	Do. C . .	118—121	4 19 3	..
52,000	50	,,	10	—	Do. D . .	..	—	..
249,980	5	April 29	8	—	Primitiva Ord. . . .	5½—6	6 18 4	42/6
499,960	5	June 26	5	2/6	,, 5 p.c. Pref. .	4⅝—5	5 0 0	67/6—70/-
521,600	100	June 2	4	4	,, 4 p.c. Deb. .	91—93	4 8 0	..
—	—	—	—	4	,, ,, ,, 1911	..	—	..
346,198	Stk.	June 26	4	4	River Plate 4 p.c. Deb.	85—87	4 12 0	..
150,000	10	May 14	6	6/-	San Paulo { 6 p.c. Pref.	10½—11	5 9 1	..
125,000	50	July 1	5	5	5 p.c. Deb.	47—49	5 2 0	..
135,000	Stk.	Mar. 12	10	10	Sheffield A	223—224	4 9 3	..
209,284	,,	,,	10	10	Do. B	223—224	4 9 3	..
538,500	,,	,,	10	10	Do. C	220—222	4 10 1	..
90,000	10	May 28	9	6/-	South African	10½—11½	7 16 6	..
6,609,895	Stk.	Feb. 10	5/4/0	44/-	South Met., 4 p.c. Ord.	111—113	4 16 8	84½—85⅜
1,896,445	,,	July 10	3	3	Do. 3 p.c. Deb.	72¾—74½	4 0 6	..
224,820	Stk.	Feb. 26	8½	8	South Shields Con. Stk.	157—159	5 6 11	..
952,795	Stk.	Feb. 26	6	48/4	S'th Suburb'n Ord. 5 p.c.	114—116	5 3 5	..
80,000	,,	,,	5	5	Do. 5 p.c. Pref. .	110—112	4 9 3	..
135,000	—	—	—	48/4	Do. West Kent. .	..	—	..
187,558	Stk.	June 26	5	5	Do. 5 p.c. Deb. Stk.	116—118	4 4 8	..
647,740	Stk.	May 14	5	5	Southampton Ord. . .	99—102	4 18 0	..
190,000	Stk.	Feb. 12	7½	7½	Tottenham { A 5 p.c. .	186—188	5 6 3	..
782,375	,,	,,	6	6	District { B 3½ p.c. .	116—117	5 2 7	92½
181,255	,,	June 26	4	4	4 p.c. Deb.	87—89	4 9 11	..
189,880	10	Dec. 30	5	—	Tuscan, Ltd.	5—6	8 6 8	..
149,900	10	July 1	5	5	Do. 5 p.c. Deb. Red.	93—95	5 5 3	..
226,476	Stk.	Mar. 12	5	5	Tynemouth, 5 p.c. max.	103½—109½	4 11 4	..
					Wandsworth, Wimbledon, and Epsom—			
80,000	Stk.	Feb. 26	8⅜	78/9	Wandsworth A 5 p.c.	151—155	5 7 4	..
255,636	,,	,,	6⅜	63/9	,, B 3½ p.c.	122—124	5 2 7	..
108,075	,,	,,	5/17/8	55/11½	,, C 3½ p.c.	110—115	5 2 0	..
259,000	,,	,,	6½	67/6	Wimbledon 5 p.c. .	117—122	5 0 5	..
98,000	,,	,,	6⅛	63/9	Epsom 5 p.c. . . .	121—126	5 5 3	..
98,416	,,	June 26	8	8	8 p.c. Deb. Stk. .	66—69	4 6 11	..

† Paid on Old 10 p.c. and 7 p.c. Standard Stocks.

New Gas Supply Regulations at Kalamazoo.

The City Council of Kalamazoo (Mich.) recently formulated a new gas ordinance, which has now become operative. Under it the Gas Company will be obliged to extend their mains without charge for a distance of 100 feet for each new customer, provided they are required to do so by the City Council. In order, however, to obtain this free main extension, prospective customers must contract to use the service for at least twelve months, and make petition to the City Council. In the next place, the city will inspect every meter before it is installed by the Gas Company. Upon application to the City Clerk, any consumer may have his meter tested by the City Engineer, providing a deposit of $1 is made. If the meter is found to be registering fast, a proportionate rebate will be allowed on the gas bills for the preceding six months. The ordinance requires that a duplicate slip of the monthly reading of gas-meters be left in the homes or places of business when the meter is read. All meter readers will also be required to display credentials upon request before they will be allowed to enter any house or building. Before the ordinance was adopted, the Committee, upon the recommendation of the United States Bureau of Standards, reduced the maximum daily heat value average from 575 to 550 B.Th.U.

Reduction in Price at Bristol.—The Bristol Gas Company announce a reduction of 2d. per 1000 cubic feet in the price of gas for the current half year—reducing the charge from 2s. 6d. to 2s. 4d. per 1000 cubic feet. The charges for gas used through prepayment meters will be reduced proportionately. It is also reported that a conditional allowance of 3d. per 1000 cubic feet will be made to users of gas for power purposes and to those consuming half-a-million cubic feet and upwards per annum, as before.

Dorchester Gas and Coke Company, Limited.—In presenting to the shareholders the accounts for the six months to June 30 last, the Directors of the Company stated that the lighting restrictions, followed by the Summer Time Act, had caused a further decrease in the consumption of gas. They regretted that, owing to the increasing cost of labour, coal, and materials generally, they were reluctantly compelled to again increase the price of gas 2d. per 1000 cubic feet as from July 1. Dividends at the rate of 5 per cent. on the ordinary capital and 6 per cent. on the preference, both less income-tax, were recommended.

Lighting of Tipperary.—At a meeting of the Tipperary Urban Council, a report was read from Mr. Cotton, of Dublin, the Gas Adviser to the Council, suggesting that, as an alternative to the Gas Company's proposal for a contract for gas supply for public purposes, the lighting of the town should be taken over by the Council, a pressure governor be fitted to each lamp, and the Company be paid at a fixed rate per hour for the total number of hours of lighting per month. This system had been adopted in several of the London districts and in some of the larger English towns. It was decided to adopt the suggestion, and submit it to the Gas Company.

Private R. H. Dale, killed while serving with the West Yorkshire Regiment, was, before the war, in the employment of Messrs. Wilsons and Mathieson.

The Ripon City Council have authorized the Gas Committee to spend up to £150 for new retorts. This was on the recommendation of the new Manager (Mr. John Demain).

The Directors of the Alliance and Dublin Consumers' Gas Company have declared a dividend at the rate of 5½ per cent. per annum, the same as at the corresponding time last year.

In view of the inability of the military authorities to guarantee to warn the local officials of the approach of hostile aircraft until the latter might be in the immediate vicinity of the town, the Burton-on-Trent Corporation have decided to abandon the idea of sounding a buzzer by way of warning the inhabitants, and to adhere to the policy of absolute darkness in the matter of the public lamps.

A copy of the balance-sheet to June 30 last of the employees' war relief fund of the British Westinghouse Electric and Manufacturing Company, Limited, whose employees to the number of over 2100 have joined the King's Forces, has been received. The statement shows receipts to the amount of £27,965, of which £18,942 was contributed by the employees and £8790 by the Company. Payments have been made to dependants to the amount of £15,647, in addition to which there have been Christmas gifts and donations to local and National funds. The balance-sheet shows an amount of £6089 standing at the credit of the disablement and dependants fund and of £4390 in the general fund.

WANTED, FOR SALE, CONTRACTS, &c., ADVERTISEMENTS IN THIS WEEK'S "JOURNAL."

Appointments, &c., Vacant.

LADY DEMONSTRATOR. No. 6210.
GENERAL MANAGER and ENGINEER. Oxford Gaslight Company. Applications by Aug. 21.
MANAGER (TAR-PRODUCTS). No. 6211.
CHEMIST (COKING AND BYE-PRODUCTS WORKS). Yorkshire Chemical Company.
ACCOUNTANCY CLERK. Tunbridge Wells Gas Company.
CLERK. Walton-on-Thames Gas-Works.
GAS-FITTER. Saffron Walden Gas-Works.
STOKERS AND SERVICE LAYER. No. 6209.

Electrical Engineering Courses.

E. A. MANSFIELD AND CO., New Brighton.

Appointments, &c., Wanted.

ENGINEER, MANAGER, &c. No. 6203.
REPRESENTATIVE (GAS AND WATER FITTINGS). No. 6208.

Plant, &c. (Second Hand), for Sale.

BOILER TANKS. Stanley Engineering Company, Bath.
COMPRESSOR AND GAS-ENGINE. Stratford-upon-Avon Gas-Works.
GAS ANALYSIS APPARATUS. Yorkshire Electric Power Company.
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Meetings.

BRIGHTON AND HOVE GAS COMPANY. No. 5, Great Winchester Street, E.C. Sept. 1. 2 o'clock.
HORNSEY GAS COMPANY. No. 5, Great Winchester Street, E.C. Aug. 25. 3.30 o'clock.
NORTH MIDDLESEX GAS COMPANY. No. 5, Great Winchester Street, E.C. Sept. 4. 2.30 o'clock.
SOUTHGATE GAS COMPANY. No. 5, Great Winchester Street, E.C. Aug. 31. 3.45 o'clock.

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